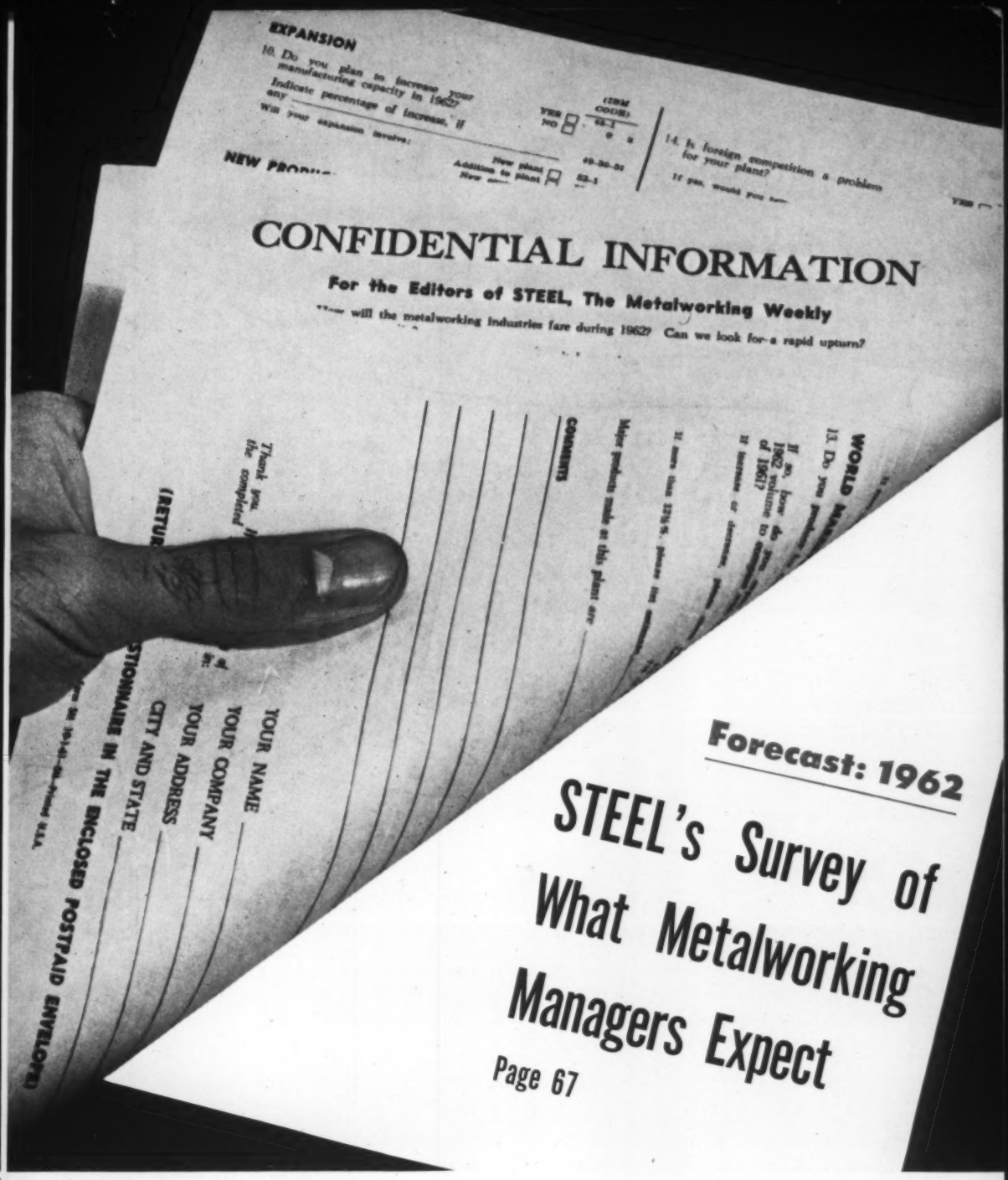
STEEL The Metalworking Weekly

NOVEMBER 27, 1961



Forecast: 1962

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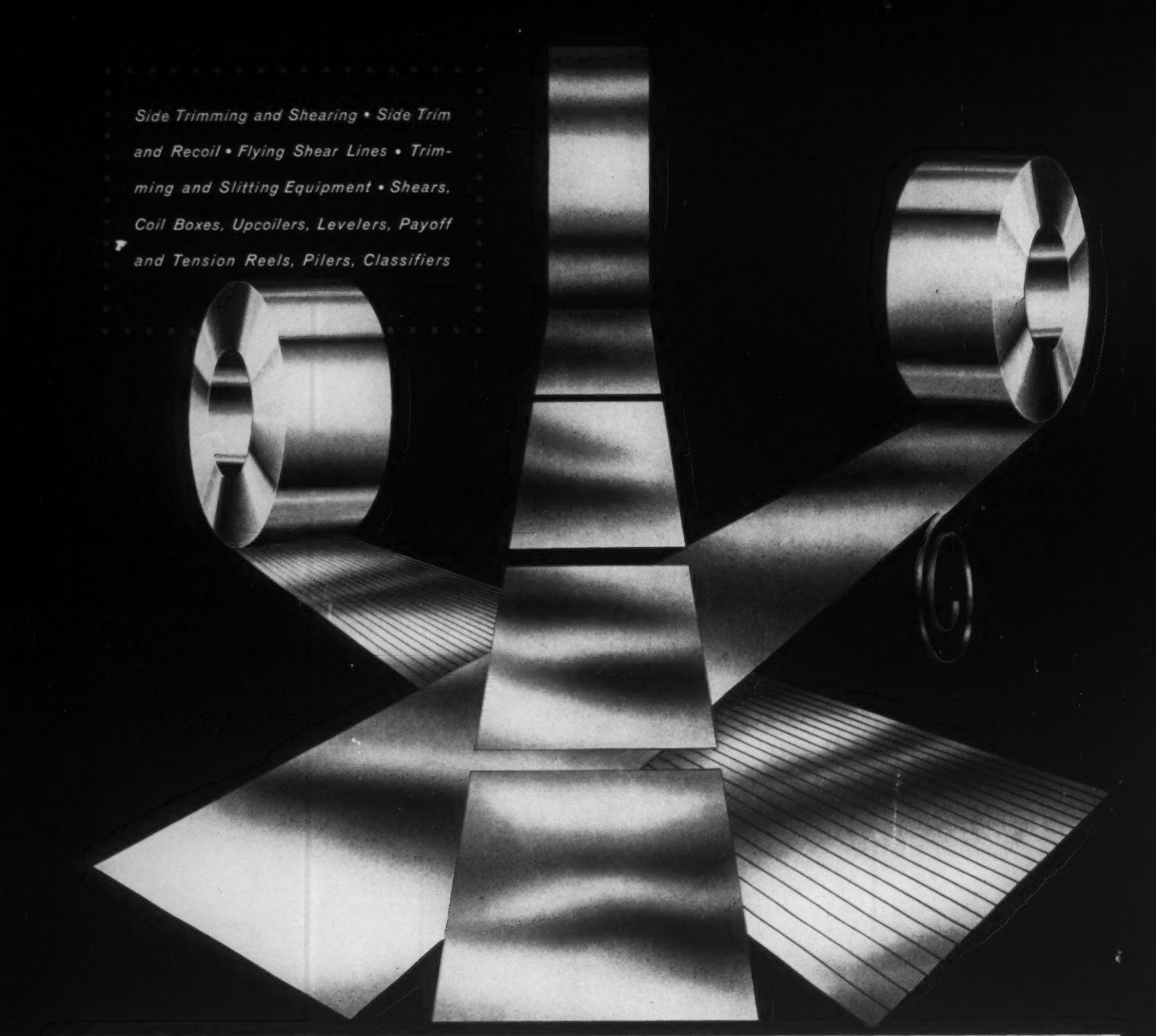
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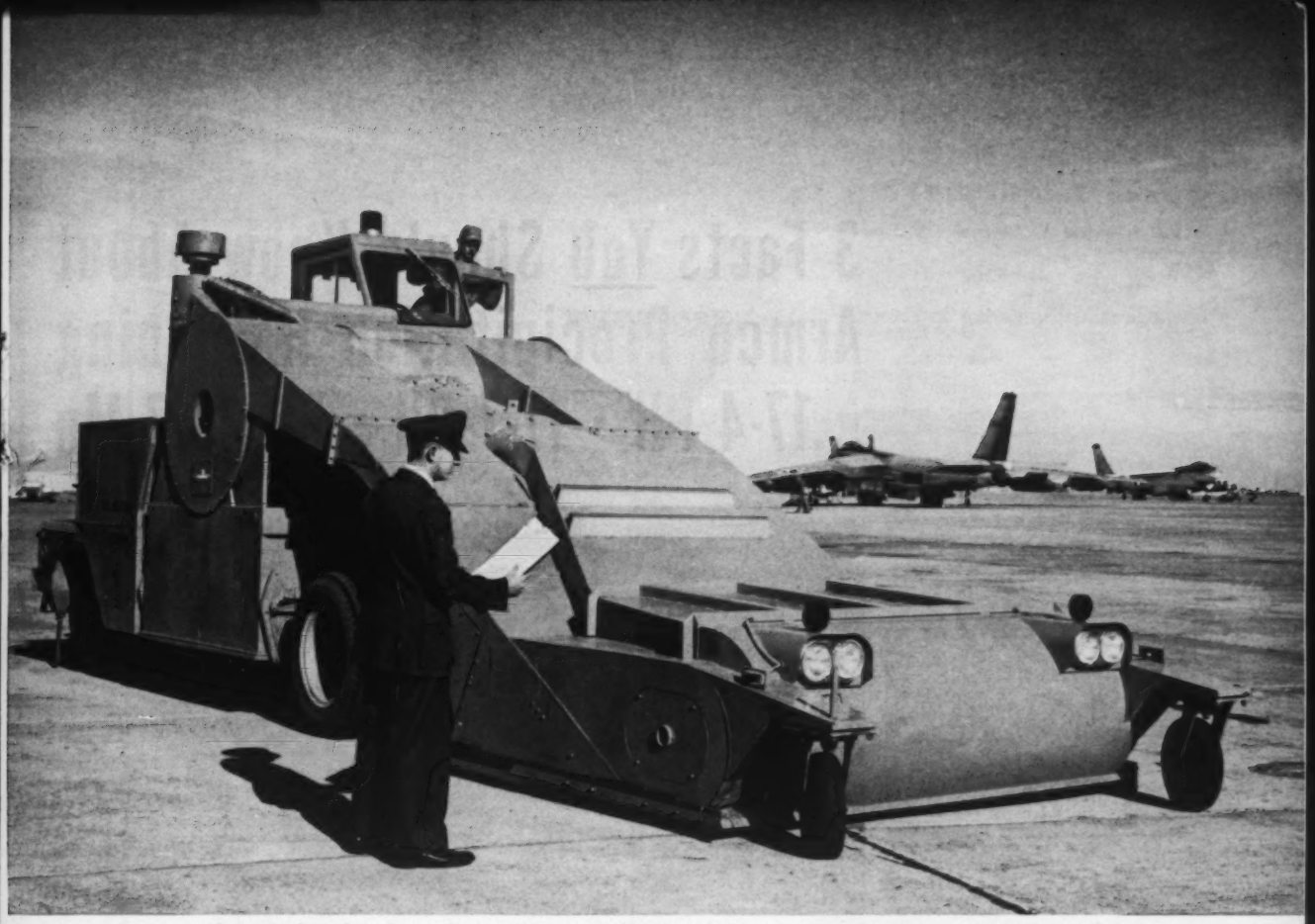

Forbes Air Force Base, Pauline, Kansas, received one of the first of 180 vacuum cleaners built by International Fermont Machinery Company, Inc., Ramapo, N. Y. Built of Bethlehem abrasion-resisting steel, it can clean 1 million sq ft of runway per hour.

Jet runways vacuumed spick-and-span by giant cleaner

...made of sheet steel

When an Air Force jet "revs up" its engines, the tremendous suction stirs up a small tornado. Loose objects on the ground are whipped into the air intake at projectile speed, sometimes causing serious damage to engine "innards."

To keep runways spick-and-span, the Air Force now uses the enormous steel vacuum cleaner shown above. It sucks up rocks, small tools, bolts—a job made to order for the rugged durability of Bethlehem sheet steel. What other material than steel could stomach such a rough and abrasive meal?

This "typical meal" shows a number of objects large enough to cause serious damage in jet-engine intakes.

Steel

for Strength
... Economy
... Versatility

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Export Sales: Bethlehem Steel Export Corporation

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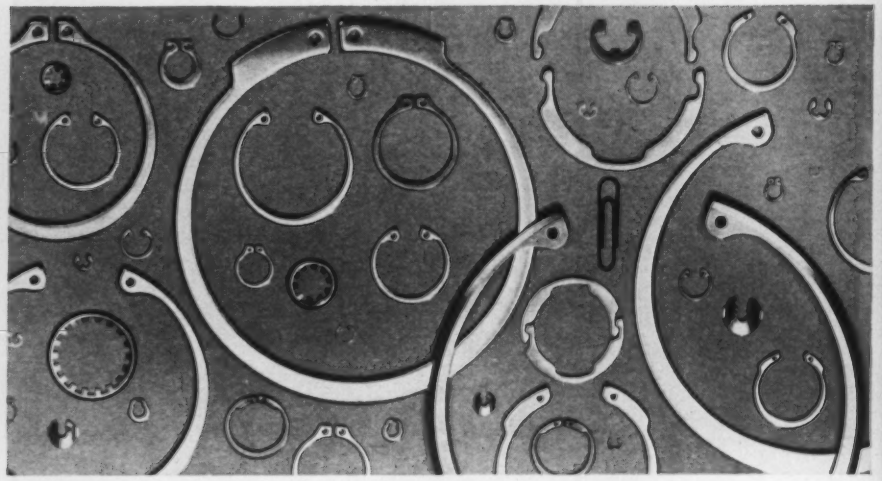
3 Facts You Should Know About Armco Precipitation-Hardening ...17-4 PH • 17-7 PH • PH 15-7 Mo

Armco 17-7 PH adds reliability to watch mainspring.



Retaining rings of Armco PH 15-7 Mo have extra "muscle."

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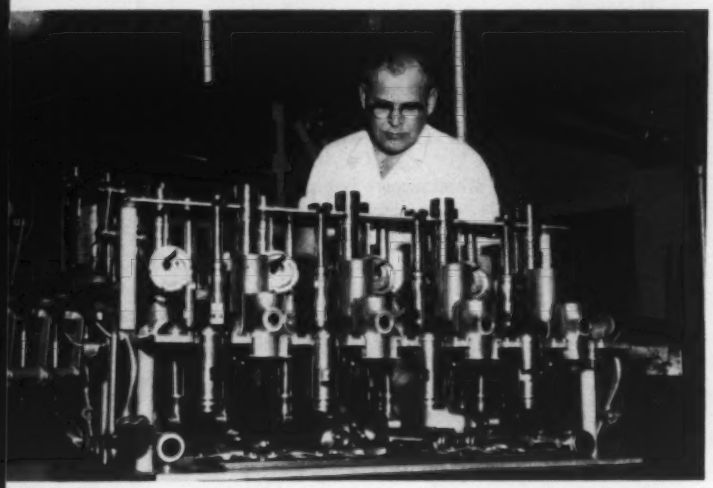
This label on your products tells customers you use modern, durable stainless steel

2. **They're not solely "aircraft metals"**—Strength, corrosion resistance and production advantages of Armco Precipitation-Hardening Stainless Steels are adding stamina and durability to a large and growing number of industrial and commercial products—and doing it at savings over other materials.
3. **They're available in a complete range of forms**—In sheets, strip, plates, billets, bars and wire—Armco Precipitation-Hardening Stainless Steels are available in the form, size and condition to do the job. They're *readily* available, too—direct or through one of the Armco Stainless Steel Distributors listed here. For detailed information, fill in and mail the coupon.

Stainless Steels

New steels are born at Armco



Critical parts of milk packaging equipment protected by Armco 17-4 PH.

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Please send more information on ☐17-7 PH ☐17-4 PH ☐PH 15-7 Mo

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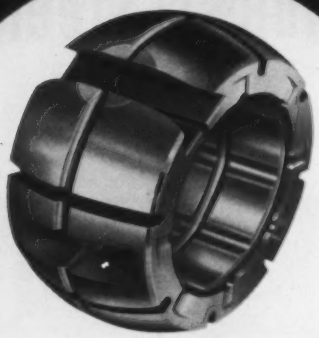
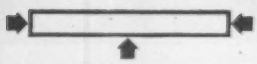
The exclusive features of the new Landis plain grinders are built around these four machine essentials to assure reliable, quality production.

Landis 10" Type R plain grinder with angular wheelbase combines important new features.

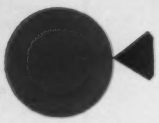


Wheel support. Exclusive Landis Microsphere wheel spindle bearing assures less sparkout time, finer finishes, faster production.



Work support. Exclusive wedge work rest and loaded ball spindle footstock give maximum rigidity to work parts.

Wheelfeed. Exclusive Landis Microfeed® is a pulse feed in millionths to final size that meets closest tolerances on a production basis.



Wheel dressing. Exclusive Landis Truform dresser with ball slide, shake-free construction. Assures exact duplication of all wheel profiles.

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LANDIS TOOL COMPANY, WAYNESBORO, PA.

Quality Control

Among other things, Associate Copy Editor Glenn Dietrich is responsible for the "quality control" of editorial material in STEEL. He checks all pages before they go to press for typographical and other errors.

Glenn showed up at STEEL in 1956 when we were looking for a man of his attainments. As a test, Associate Managing Editor John Morgan had a page revised, 20 errors being deliberately inserted. When Glenn took the test, he found 22, two errors having been previously overlooked. Glenn was hired on the spot.

Before joining STEEL, Glenn was an editor for McGraw-Hill Publishing Co. in New York. Prior to the New York stint, he had worked on several newspapers and business publications in northeastern Ohio. He started out as a newspaper reporter 40 years ago this month.

What Managers Expect in 1962

Metalworking executives are conservatively optimistic about business prospects next year. But to get the full story, hurry to Page 67, where News Editor Bill Dean and Assistant Editor Charlie Goerth have put together a concise summary.

They asked 5000 managers to foretell at what rate their plants will operate in 1962. Those operating men have been making such forecasts for STEEL since World War II, and their past performances have established a remarkable record for precision. With one exception, they have accurately predicted the direction of the business trend every year. The exception occurred in 1958 when many crystal balls were shattered.

We Get Letters

Geraldine, cleaning woman and night editor, insists that we make more note of the letters editors receive, so . . .

"We congratulate you on the high quality of your magazine. STEEL needs no introduction to executives in the Australian metal industries."—L. R. Davies, editor of *Metal Trades Journal*, North Sydney, Australia.

"The article (Oct. 30, p. 68) on volume production of the Tape-O-Matic told our story better than we could tell it."—D. C. McCarthy, executive vice president, Pratt & Whitney Co. Inc., West Hartford, Conn., concerning a story by Technical Editor Bob Huber.

"It is a pleasure to read editorials like yours in STEEL . . . We need more voices talking up for industry."—Roland Lehr, president, Baker Bros. Inc., Toledo, Ohio, concerning Editor Walter Campbell's "Lost: One Sale" (Oct. 30, p. 25).

Collective Bargaining

Here's a little ditty that appeared in the Chrysler labor pressroom at the end of negotiations. The author is unknown, but a UAW member is suspected:

We wheedled and threatened and blustered,
We ranted and wrangled and roared,
We chided and fretted, we scoffed and we petted,
We snickered and wept and implored,
We groveled and swore and demanded,
We spurned and we fawned and we brayed,
We trampled on data, we tossed ultimata,
We grumbled and stamped and inveighed.

We whimpered and simpered and shouted,
Pretended, defended and doubted,
We smiled and we jested,
Reviled and protested,
Debated, orated and scouted!

We slurred, we purred, we sighed, defied,
We wailed and railed and clamored.

We fumed and sneered and we whined,
We flattered, cajoled and maligned,
Consented, revoked and declined—
And, finally the contract was signed.

Puzzle Corner

The answer to our Nov. 13 excursion into metaphysical math: If one-third of 6 were 3, 6 would be 9; 20 would be 30; and one-fourth of 30 is 7.5. First in with the correct answer were William J. Regan III of Pittsburgh Steel Co. and H. G. Haussig of Heckett Engineering Co.

Here's another for you: A 3 in. cube, painted black, is sawed into 1 in. cubes. How many cubes are painted on three sides, two sides, and so on?

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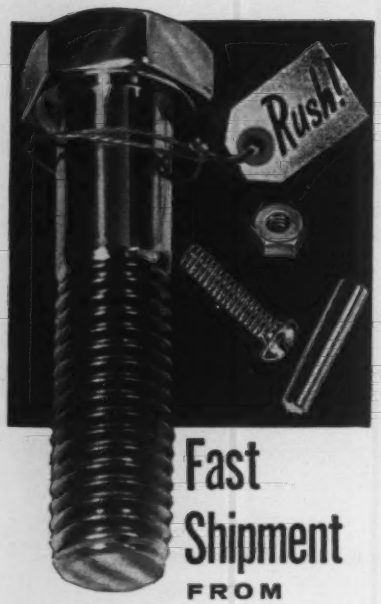

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Fluid Power NEWS

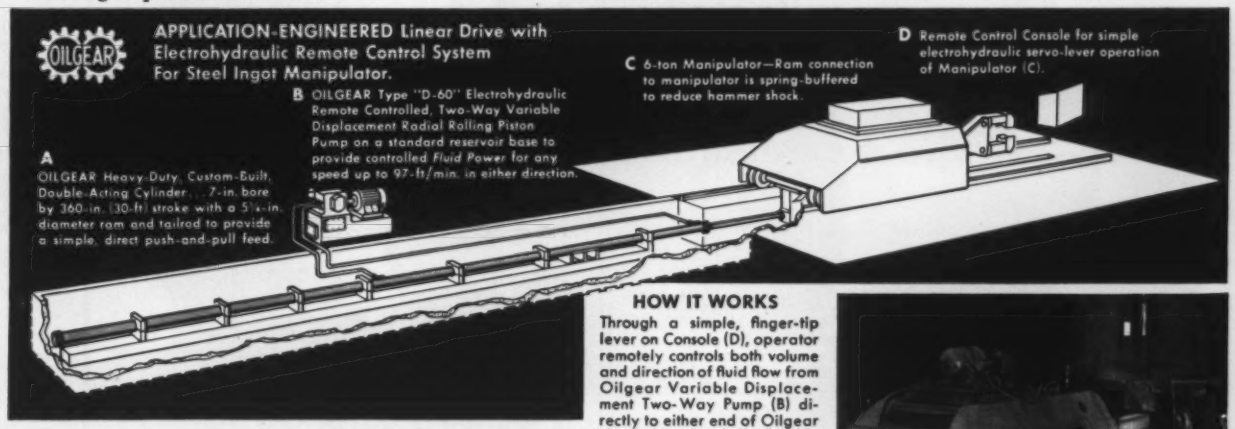
OILGEAR 40 Years of Fluid Power

From Oilgear *Application-Engineering* Files

HOW OILGEAR DRIVE SYSTEM ON INGOT MANIPULATOR IMPROVES CONTROL—CUTS DOWNTIME

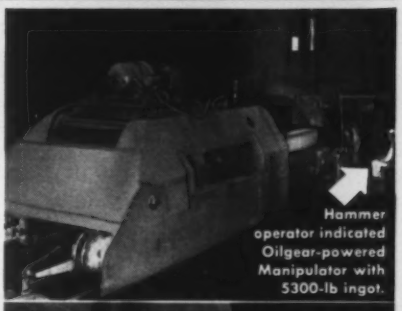
DATA: Replace an electric variable speed drive on a 6-ton ingot manipulator because of excessive maintenance downtime, high rebuilding and replacement costs. Initial replacement plans called for a hydraulic variable speed drive directly to manipulator wheels, retaining customary practice of operators riding on manipulator. A job study revealed that while feeding an ingot under the open frame steam hammer, forward motion is momentarily stopped by each hammer impact—frequently bouncing manipulator wheels in the air, causing traction, speed control, shock, and operator fatigue problems.

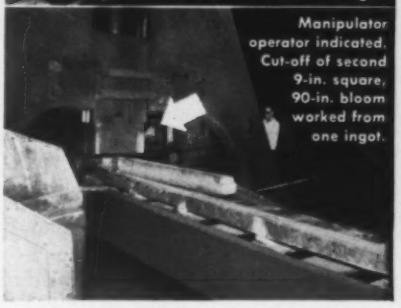
Basic Manipulator Drive Requirements were re-evaluated as follows: 1. Remove drive from manipulator to reduce shock-provoked maintenance downtime. **2.** Drive to be independent of wheel traction to improve feed and control. **3.** Provide stepless, remote speed control from zero to maximum in both directions. **4.** Withstand severe shock, vibration, heat, and dust on a continuous 16-hour day basis. **5.** Reduce operating, maintenance, and installation costs. **6.** Provide for future incorporation of hammer control with remote manipulator console.


APPLICATION-ENGINEERED Linear Drive with Electrohydraulic Remote Control System For Steel Ingot Manipulator.
A OILGEAR Heavy-Duty, Custom-Built, Double-Acting Cylinder . . . 7-in. bore by 360-in. (30-ft) stroke with a 5¼-in. diameter ram and tailrod to provide a simple, direct push-and-pull feed.
B OILGEAR Type "D-60" Electrohydraulic Remote Controlled, Two-Way Variable Displacement Radial Rolling Piston Pump on a standard reservoir base to provide controlled *Fluid Power* for any speed up to 97-ft/min. in either direction.
C 6-ton Manipulator—Ram connection to manipulator is spring-buffered to reduce hammer shock.
D Remote Control Console for simple electrohydraulic servo-lever operation of Manipulator (C).

HOW IT WORKS

Through a simple, finger-tip lever on Console (D), operator remotely controls both volume and direction of fluid flow from Oilgear Variable Displacement Two-Way Pump (B) directly to either end of Oilgear Custom Cylinder (A). Only two pipe lines are required. Power input is used only in proportion to work performed, as no pump output power is wasted in direction control valves, external relief valves, flow control valves, auxiliary components, or excessive piping. Stepless, infinitely variable, smooth, steady manipulator speeds are instantly available in either direction. Fluid flow and pressure decelerate to zero as flow direction is changed—flow and pressure then accelerate to any selected amount in the new direction . . . reversal is smooth-cushioned — shock is eliminated. Controlled acceleration and deceleration; hydrodynamic braking; automatic pressure and flood lubrication; continuous filtration of power fluid . . . all are inherent features of Oilgear "Any-Speed" Drive Systems.


Hammer operator indicated Oilgear-powered Manipulator with 5300-lb ingot.


Manipulator operator indicated. Cut-off of second 9-in. square, 90-in. bloom worked from one ingot.

SOLUTION: An Oilgear Linear Drive and Electrohydraulic Control System as shown above schematically. This departure from customary manipulator drives has proved—*in over two years of operation*—to have the following advantages: **1.** Lower operating costs . . . previous manipulator averaged 12% to 15% downtime every 16-hour day for repair and adjustment of drive and control components. **2.** Direct push and pull linear drive is a more positive, smoother, shockless feed—NOT affected by variations in wheel traction. **3.** Remote console with simple electrohydraulic servo control eliminates operator discomfort and fatigue. **4.** Cylinder is protected below floor—"Power-Pak" is mounted away from heat and dust of work area. **5.** Constant, automatic overload protection insures longer life, prevents damage.

System was selected due to Oilgear's reputation for trouble-free reliability, long life, simplicity, and on-the-job-proved performance of the following *Oilgear-Powered* equipment in this user's plants . . . 300-ton ingot strippers . . . large forming presses . . . tube pointing presses . . . hydrostatic testers . . . stripping presses . . . pipe benders . . . seamless steel tube piercers . . . planers . . . cut-off machines . . . tube threaders—operating efficiently—in constant, daily use—some have been in service for more than 20 years.

User Reports—" . . . well pleased with the steady feed rate at both low and high speeds . . . we'll go to this type of drive when we rebuild or require another Manipulator."

For accurately controlled linear or rotary power—for the lowest cost per year . . . check with Oilgear!

For practical solutions to YOUR linear or rotary Controlled Motion problems, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . . . .

THE OILGEAR COMPANY

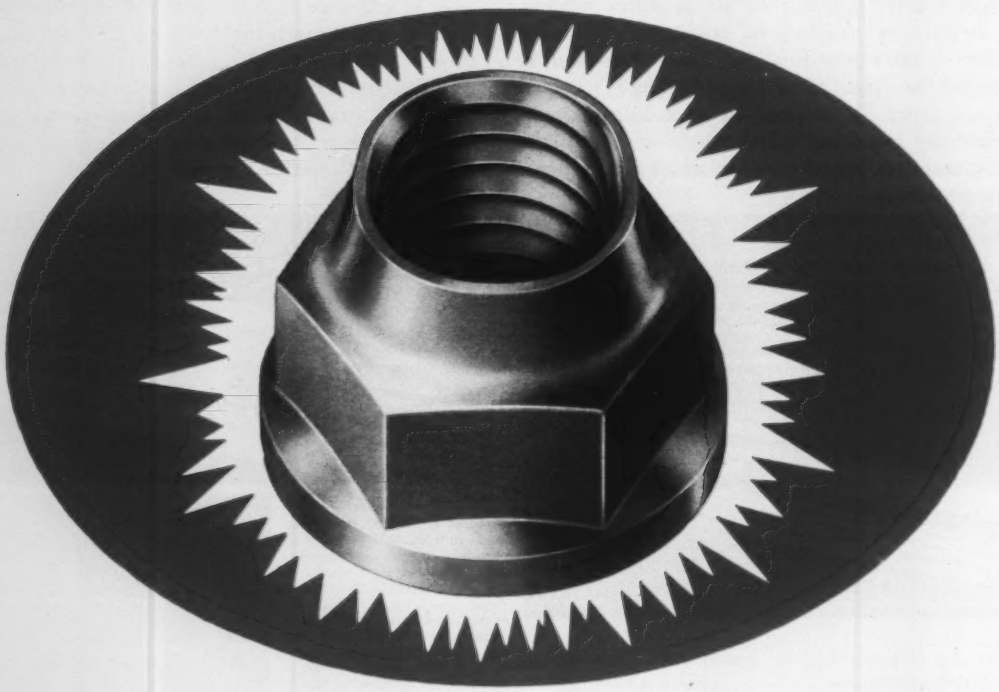
Application-Engineered Controlled Motion Systems

1572 WEST PIERCE STREET • MILWAUKEE 4, WISCONSIN

Phone: Mitchell 5-6715 . . . Direct Distance Dialing Code 414

ALLEN introduces

LOKON....



True to its name, the LOKON nut locks on a companion threaded member with a can't-shake-loose grip . . . holds indefinitely against heaviest impact and vibration. Because the basic design allows adequate deformation of the "turret top" without overstressing any portion of the periphery, "LOKONS" are highly resistant to fatigue failure. And, through closely controlled heat treatment, a degree of elasticity is achieved which permits re-use time after time without significant impairment of the locking action.

LOKON locknuts assemble fast and easy . . . start with finger spinning . . . tighten smoothly . . . lock at any point as soon as the threads in the elliptical section are fully engaged, and are readily removed without damage to the nut or mating part.

Investigate LOKON at the first opportunity. Discover the many ways this major development in locknuts can save you time and cut costs. Test samples* and engineering data are yours for the asking. And, for prompt, off-the-shelf delivery, call your nearby Allen Distributor who carries full stocks of LOKON locknuts as well as dependable Allen hex-socket screw products.

**Currently offered in sizes from No. 10 through ½", UNC and UNF threads. Other sizes available soon.*

ALLEN HEAD **ALLEN**

THE ALLEN MANUFACTURING COMPANY
HARTFORD 1, CONNECTICUT, U. S. A.
Plant at Bloomfield, Conn. • Warehouses in Chicago, Cleveland, Los Angeles

FOR OVER 50 YEARS, MAKERS OF **STEEL**

NEW ... general-purpose LOCKNUT

holds positively tight even after repeated on-off cycles.

provides a "commercial" locknut in the "aircraft" quality range.

offers high strength without bulk for heavy-duty applications.

Only "LOKONS" offer all these extras . . . all without EXTRA COST!

ONE-PIECE, ALL-METAL CONSTRUCTION — The LOKON design requires no segments, inserts or other auxiliary locking devices.

HIGH-GRADE ALLOY STEEL — Heat treated to Rc 26/30. Imparts tensile strength in excess of 250,000 psi and provides lasting spring tension for unlimited re-usability.

CLASS 3B THREADS — Comply fully with specification MIL-S-7742 and H-28 Handbook.

BUILT-IN FLANGE — Large-area bearing surface saves washer cost, speeds assembly, reduces indentation. Face of flange is held square with threads to insure even distribution of stresses throughout the flange and thread area.

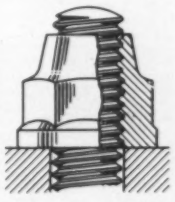
DIMENSIONAL ACCURACY — Allen "pressur-forming" processes control grain flow, hold tolerances to consistently close limits, and produce fully-formed hex corners for sure-grip wrenching.

HIGH TEMPERATURE SERVICE — Performance is unaffected at temperatures to 550°F.

MILITARY SPECIFICATIONS — LOKON locknuts fulfill the performance requirements of specification MIL-N-25027.

How *LOKON* locks . . .

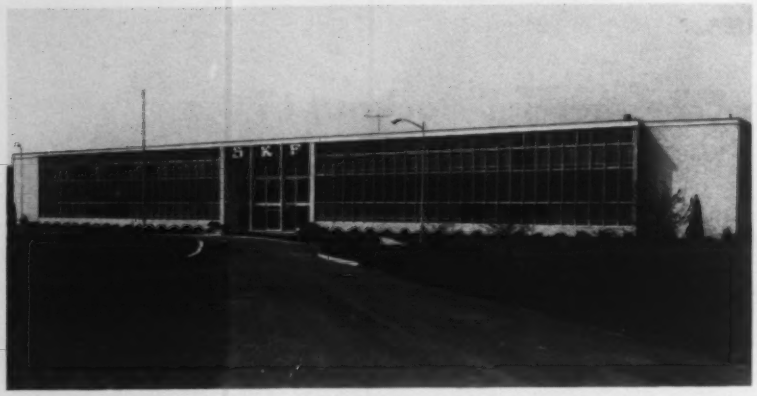
The threads in the tapered crown of the nut are slightly distorted from the round. When assembled to a companion threaded member, this out-of-round condition causes the nut to resist free entry of the mating part. As the metal flexes in an effort to conform to the circular pattern of the male threads, friction on the flanks of the nut threads is increased. The compressive forces exerted as a result of this diaphragmatic flexing action produce a positive, powerful locking grip.



FAMOUS ALLEN SOCKET SCREW PRODUCTS

SKF AND PENNSYLVANIA
KEYSTONE OF INDUSTRY

Another example of community-state cooperation in 100% FINANCING



SKF INDUSTRIES, INC.'S new plant addition at Altoona in Blair County—an ultramodern ball-bearing manufacturing facility—will employ 600 workers at full capacity, covers 110,820 square feet of plant and office space, and represents a total investment of 1½ million dollars.

Under this cooperative "100% Financing Plan," the Pennsylvania Industrial Development Authority granted a $450,000 loan; the 50% first mortgage was provided by a leading Pennsylvania bank; Altoona Enterprises, Incorporated (a local non-profit agency) financed $300,000.

LOANS = NEW PLANTS = NEW JOBS

A minimum 2% interest rate and a maximum 25-year term on state and local agency loans—50% of the total project cost.

In just over five years, the Pennsylvania Industrial Development Authority has made 183 project loans, totaling $22,234,480, to build or expand plants representing an investment of $67,985,618.

These new plants and expansions have created 30,438 jobs, with estimated annual payrolls of $111,918,495.

Get Full Details Now!

The "Pennsylvania Plan" offers complete financing on lease or lease-purchase arrangements. Hand-pick the type of community that best meets your location requirements; choose from plant "shells" now ready for completion to your specifications. Over 150 Pennsylvania community development groups have funds and a record of proven experience in all phases of industrial location and financing.

Investigate the potentials of a Pennsylvania plant location now! Write for:

- Facts on "100% Financing For Your New Plant in Pennsylvania"
- Full details on Pennsylvania's equitable "Tax Climate"
- "Plant Location Services" brochure
- Current listing of available industrial buildings and sites
- Special reports and tabulations, tailored to your specific location requirements, covering—Labor, Markets, Transportation, Materials, Minerals, Water, Power, Fuel, Engineering Facilities, Taxes and Community Data

PENNSYLVANIA PLANT LOCATION FACTORS

ADDRESS INQUIRIES TO:

PENNSYLVANIA DEPARTMENT OF COMMERCE
DIRECTOR OF INDUSTRIAL DEVELOPMENT
Room 443 • South Office Building • Harrisburg, Pennsylvania
Phone: CEdar 4-2912

CALENDAR
OF MEETINGS

Nov. 26-Dec. 1, American Society of Mechanical Engineers: Winter annual meeting, Statler Hilton Hotel, New York. Society's address: 345 E. 47th St., New York, N. Y. Secretary: O. B. Schier.

Nov. 27-29, Plumbing Brass Institute: Annual meeting, Savoy-Hilton Hotel, New York. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Executive secretary: T. H. Nichols.

Nov. 27-30, American Institute of Steel Construction Inc.: Annual meeting, Boca Raton Hotel and Club, Boca Raton, Fla. Institute's address: 101 Park Ave., New York 17, N. Y. Executive vice president: L. Abbett Post.

Nov. 28-30, Electronic Industries Association: Section meetings, Statler Hilton Hotel, Los Angeles. Association's address: 1721 DeSales St. N. W., Washington 6, D. C. Secretary: James D. Secrest.

Dec. 1, Malleable Founders Society: Semi-annual meeting, Sheraton-Cleveland Hotel, Cleveland. Society's address: 781 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Dec. 1-3, National Federation of Independent Scrap Yard Dealers Inc.: Annual convention, Barbizon-Plaza Hotel, New York. Federation's address: Suite 1607, 29 Broadway, New York 6, N. Y. Administrative secretary: Lucille Schneider.

Dec. 5, Electric Overhead Crane Institute Inc.: Annual meeting, Carlton House, Pittsburgh. Institute's address: 1 Thomas Circle, Washington 5, D. C. Executive secretary: Joe H. Peritz.

Dec. 6-8, Metallurgical Society of AIME: Annual electric furnace conference, Iron & Steel Division, Penn-Sheraton Hotel, Pittsburgh. Society's address: 345 E. 47th St., New York, N. Y. Secretary: R. W. Shearman.

Dec. 6-8, National Association of Manufacturers: Annual meeting, Waldorf-Astoria Hotel, New York. Association's address: 2 E. 48th St., New York 17, N. Y. Executive vice president: Charles R. Sligh Jr.

Dec. 7-8, Society of the Plastics Industry Inc.: Plastic film, sheeting, and coated fabrics conference, Pierre Hotel, New York. Society's address: 250 Park Ave., New York 17, N. Y. Executive vice president: William T. Cruse.

Dec. 27-29, American Marketing Association: Annual winter meeting, Biltmore Hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive director: Vance E. Lockhart.

. . . for one thing, they're kicking yesterday's production costs into a cocked-hat.

What's more, it's the pushbutton automated foundry that is supplying automotive manufacturers with connecting rods, crank and cam shafts. It's the pushbutton foundry that can meet the price and delivery demands of the plumbing and appliance industries.

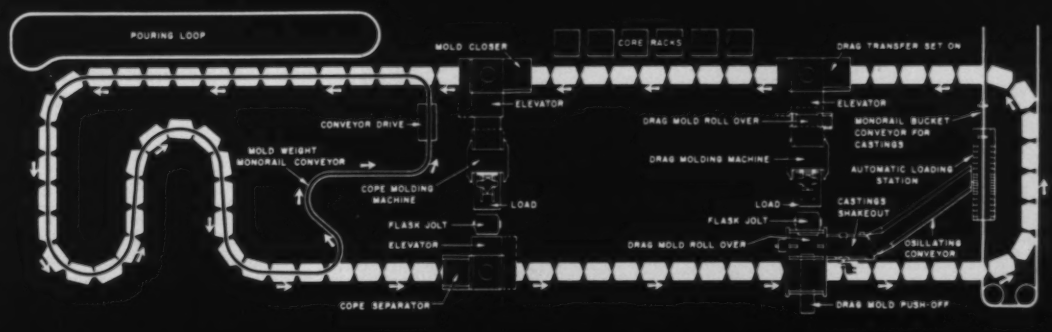
A pushbutton in the foundry can lower your unit cost and keep you competitive. (Re-check your bids with the well equipped and modern foundry, and you'll see the difference.)

SPO, as the world's largest supplier of foundry molding machines and related equipment, will continue research, engineering and production of mechanized systems that will provide the foundry with the competitive edge. If you would like technical information or assistance relating to the industry we serve, please contact SPO, INCORPORATED, 7500 Grand Division Ave., Cleveland 25, Ohio. Telephone Diamond 1-3666.

WORLD'S LARGEST SUPPLIERS OF MOLDING MACHINES

SPO

LOOK WHAT PUSHBUTTONS ARE DOING IN THE FOUNDRY



Cosco Stools, Tables, Carts are . . .

"Made Like A Million" with Pittsburgh Steel Sheet

Make your products "like a million" and you'll sell them by the million.

That's the philosophy practiced at Hamilton Cosco, Inc. of Columbus, Indiana, manufacturer of nationally known Cosco brand tubular steel frame household and juvenile products and office chairs.

And the philosophy has paid off.

Introduced 16 years ago, Cosco household stools have averaged nearly a million units a year. Their success led to development of other popular Cosco products ranging from baby jumpers to executive office chairs.

Pittsburgh Steel Company plays an important part in Hamilton's success by supplying substantial quantities of cold rolled sheet that consistently meet Cosco's ultra-critical requirements.

For, at Hamilton there's no such thing as a "second" in a finished product, be it serving cart or stool, playpen or folding bridge chair. The slightest imperfection — in forming, bending, painting or plating — requires reprocessing or scrapping of the defective item.

Supplying cold rolled sheet that faithfully meets such air-tight quality control places unusual responsibility on the steel supplier.

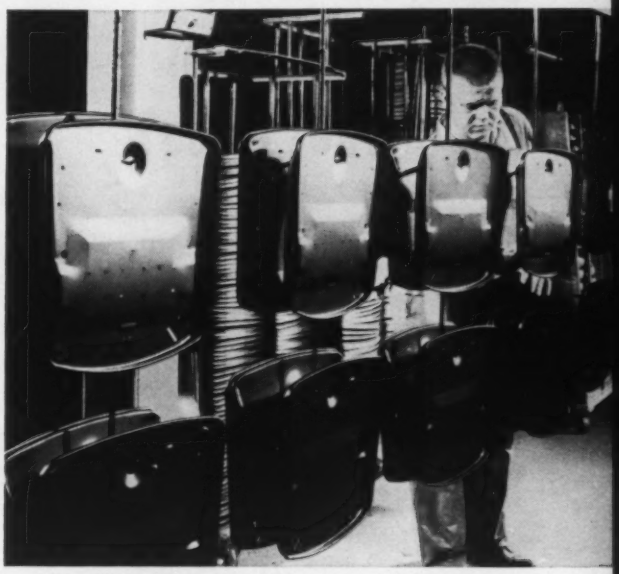
But, Pittsburgh Steel regularly meets this obligation with sheet known throughout the metalworking industry for its three "F" qualities:

- **Flatness** — for exposed surfaces where appearance is vital and for fast production on automatic and semi-automatic equipment.
- **Finish** — dense, exceptionally clean surface for critical finishing operations, particularly Hamilton's electrostatic painting process.
- **Formability** — for precise uniformity in stamped, drawn, rolled or bent shapes; and especially for non-fluting characteristics in difficult bends on electric-welded tubing rolled

The three "F" features of Pittsburgh Steel sheet—**flatness, finish, formability**—show up in assembly of the popular Cosco "Hour Glass" step stool. Gleaming backrests, gracefully curved tubular legs and brackets, seat pans and fold-away steps, all reflect quality of Pittsburgh cold finished sheet.

Flatness of Pittsburgh cold rolled sheet is critical for appearance, rigidity of stool seat and for trouble-free production in long runs. Here, after forming and piercing, raw edges are turned under.

Formability of Pittsburgh Steel sheet is demonstrated here as ¾ inch tubing, rolled from slit sheet, takes severe bends and deformation required for backrest brackets. Non-fluting quality of steel on radius of bends is vital on this and all other tubular parts produced by Hamilton Cosco, Inc.



Finish of Pittsburgh Steel sheet provides dense, exceptionally clean surface for tight, smooth paint adherence required by Hamilton's electrostatic painting process. Seat pans for Cosco's unique gatefold card table chairs show painting quality of steel.

from Pittsburgh Steel sheet.

H. E. Spurgeon, purchasing agent, said:

"The company's success is based on its insistence on absolute quality of its products—and that means quality starting with raw steel. We do many things merely because it's the best way.

"Performance of Pittsburgh sheet is very good, we've found. Over-all, I'd say Pittsburgh Steel is a very satisfactory supplier."

Pittsburgh Steel Company sheet—the steel with the three "F" qualities—can help step up your product quality, too, whether you're using hot rolled or cold rolled, sheet widths or strip widths. Contact one of the Pittsburgh Steel Company District Offices listed here. We'll match the steel to your product.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

Steel

Will your product stand the test of the market place?

The decision to change a material in a product can often determine its success or failure in today's business of selling. It is in this heavily mined zone of decision that men and boys separate. The odds are generally fair. The right decision is a plum; the wrong one is a lemon.

The decision to specify a change in a basic material for a product can have equally good and bad results. The market will soon determine the wisdom of the decision to change. To get to the point: the decision to specify stainless steel for a product can become a marketing edge or a costly dud. In most cases, it is no easy decision. Stainless steel may cost more in the beginning. This added cost is reflected in the finished product generally. But note well: not always.

The primary point is that stainless steel, although handicapped with a higher price, will generally win the performance race against most other materials. Now, higher price squares against better performance. This is the what-price-quality dilemma. It is in this area where plums and lemons come into being. Better performance can bring in greater market acceptance; higher price can leave your product rejected. This market reaction, in turn, is based on price buyers and performance buyers. However, there's a bedrock adage: you get what you pay for.

Give stainless steel a fair shake. To help you measure it against other materials, here are some points that may persuade you to consider it.

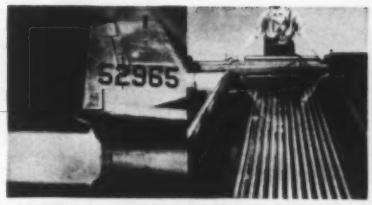
Look at Your Product		Yes	No	Maybe
1	Is painting necessary for appearance?			
2	Will paint or other surface coating stand up in service?			
3	Does your product suggest quality?			
4	Would a bright, lustrous finish add sales appeal?			
5	Does your product require repeated cleaning?			
6	Does the surface have to be clean, smooth, attractive?			
7	Is your product exposed to weather, dirt, food, chemicals, pests, water, abrasion, impact, heat or extreme cold?			
8	Will replacement costs and annoyance to the user impair repeat business?			
9	Are there times and places where your product in use calls for great strength and utmost reliability?			
10	Can you save in packing and shipping costs with a lighter product?			
11	Can you estimate on a percentage basis the savings in fewer service complaints and reduced damage?			

There is a chance that, with some close arithmetic, you can come up with a break-even price on the product with stainless steel—not always—but often. Do not dismiss better performance. There may be an honest competitive edge . . . and possibly a moment of glory. But no matter, when you go to stainless steel, you go first class. When you do use stainless, be sure to specify USS Stainless Steel. United States Steel offers metallurgical assistance and market building aid to develop and enlarge your uses of stainless steel. For more information on the many grades of stainless available for fast shipment, call your Steel Service Center.

USS TRADEMARK United States Steel

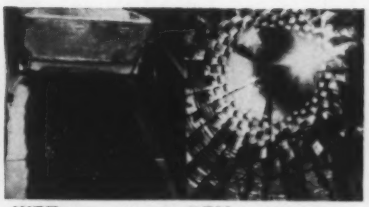
No material comes close to Stainless Steel's Versatility

By way of illustration here are a few "opposites" that prove our point



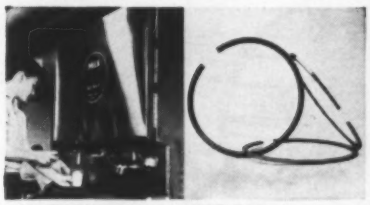
HOT. Temperatures in a jet afterburner reach 1400°F—but stainless steel doesn't lose its strength.

COLD. Stainless heat exchanger operates at temperatures as low as —443°F.



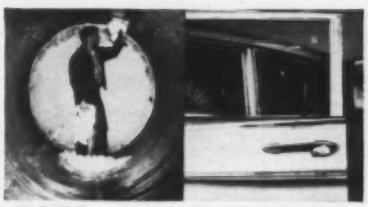
WET. Combination of moisture and coal would corrode nearly anything but stainless.

DRY. Rotary dryer is used to dry pharmaceutical ingredients.



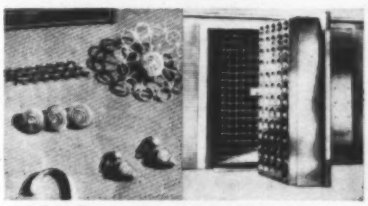
CLEAN. Milk dispensers of stainless steel prevent contamination.

DIRTY. Stainless steel piston rings have excellent resistance to high temperature corrosion.



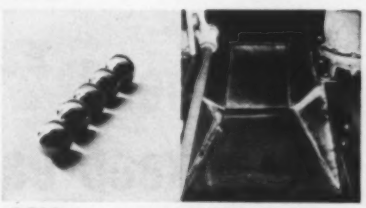
INSIDE. Chemical tanker needs only a simple wash-out for cleaning because it's stainless.

OUTSIDE. Stainless automobile trim always stays bright and good-looking.



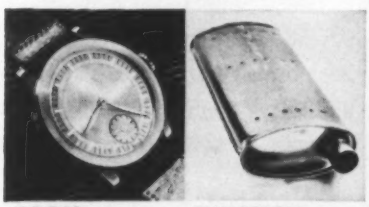
LIGHT. Stainless steel jewelry has a light, graceful appearance.

HEAVY. Strength and hardness of stainless combine to make safe doors safe.



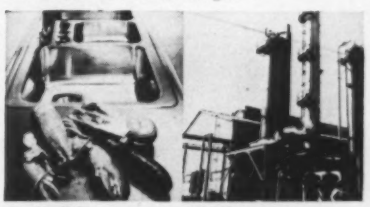
ROLL. Stainless ball bearings take a lot of punishment, still operate at peak efficiency.

SLIDE. Abrasion resistance of stainless steel makes chutes last longer.



FORM. Stainless steel wristwatch defies corrosion, keeps time *and* beauty.

FUNCTION. Stainless steel muffler keeps silent despite high temperatures.



WATER. Stainless sinks stay bright, beautiful, easy to clean.

FIRE. Stainless steel shingles inside cat crackers are red hot, still don't lose their great strength.

Order Stainless Steel from your nearest Steel Service Center

"EVEREADY" Your "green light" to safety . . . *with savings*

Why spend 73 maintenance calls per year to keep each oil switch lamp burning?

ONE CALL does the job— and does it better— when you *electrify your lamps* • You get virtually 100% unattended operation— brighter, more uniform light • In addition, with "EVEREADY" "Air Cell" batteries you get dependable, low cost, all-weather power • Batteries are activated by simply adding water— you use them up and throw them away • Ask for the complete money-saving story on electrifying your oil lamps with "EVEREADY" "Air Cell" batteries!

"Eveready," "Air Cell," and "Union Carbide" are registered trade-marks for products of

NATIONAL CARBON COMPANY

Division of Union Carbide Corporation • 270 Park Avenue, New York 17, N.Y.

IN CANADA: Union Carbide Canada Limited, Toronto

UNION CARBIDE

STEEL
The Metalworking Weekly

Metalworking Week®

November 27, 1961

What Metalworking Managers Expect in 1962

Never before have so many respondents to STEEL's annual survey of What Metalworking Managers Expect expressed optimism for sales in an upcoming year. More than three-fourths of them look for increased volume as 1962 metalworking sales head for the $162 billion mark. Here are some of the highlights from the survey:

Sales	+7.1%	Selling Prices	+1.7%
Profits	+5.9%	Employment	+3.2%
Manufacturing Costs	+3.2%	Manufacturing Capacity	+2.8%
Marketing Costs	+1.7%	R&D Expenditures	+1.8%

Companies engaged in defense production expect an over-all increase of 4.7 per cent in volume. Those producing for export look for overseas shipments to advance 2 per cent. Complete results of the survey cover eight pages in this issue, starting on Page 67.

Reuther Disappointed by AFL-CIO Internal Disputes

Believing that "collective bargaining as an instrument of economic justice has hardly begun its job," Walter P. Reuther expresses keen disappointment over the lack of progress in settling AFL-CIO internal disputes. He states: "Jurisdictional conflict persists; AFL-CIO unions still boycott the products of other AFL-CIO unions; affiliates raid each other; one department of the federation continues to compete organizationally against affiliated unions."

What's Ahead in Steel Prices?

"There appears to be no basis for a general price increase in steel at this time," says Charles L. Huston Jr., president, Lukens Steel Co. He notes: Before prices can be boosted generally, demand for steel will have to increase to the point where competition from foreign steel and pressure from aluminum and other materials are not so severe. Mr. Huston also observes that steel business is apparently improving, but the advance isn't strong enough to guarantee a continued high level of sales.

Executive Speaks Out on Free Trade

The Kennedy administration's effort to liberalize U. S. foreign trade policy is meeting the full spectrum of reactions from U. S. businessmen. Here's what Carl J. Gilbert, chairman, Gillette Co., told the National Foreign Trade Council: "We must accept our responsibility as leader of the Western Alliance and continue to reduce barriers to trade. We must go beyond the bilateralism of the early agreements into multilateral agreements. We must make the most provincial of our countrymen realize that our advocacy is for unfettered enterprise on the international level. It has long been a source of wonder to me how many of the same individuals who charm the home

town folks with their attacks on government interference and controls can support the administered prices and the control of production which the network of international tariffs and quotas, in fact, is. We must convince these individuals that protectionism is government planning on a grand scale and carries with it all the evils of it . . ."

Steel Imports Decline as Exports Rise

Imports of steel mill products dropped 12 per cent in September to $32.75 million, reports the Commerce Department. Following seven consecutive monthly increases, imports dipped to the lowest level since May. Exports rose to $34.28 million (10 per cent over August's), but they did not equal the July rate. The nine month totals: Imports, $265.9 million vs. $371.4 million last year; exports, $301 million vs. $471.5 million last year.

Breakthrough for Superconductivity

This small coil of wire is said to be one of the most powerful magnets for its size, weight, and energy consumption. Westinghouse Electric Corp. scientists wound it from a material that is superconductive at extremely low temperatures. The story on Page 131 tells of the role that new alloys play in superconductivity—a field which may open new metalworking markets and radically change many present ones over the next few years. Some possible applications: Computers, gyroscopes, power transmission, communications equipment, and space flight.

The Four Pillars of Marketing

"Too many business executives suffer from a frozen frame of reference," says Louis Cheskin of Louis Cheskin Associates, Chicago motivation researcher, in commenting on marketing problems. Controlled motivation research shows that "the international situation has made the American consumer more sober, more serious, more skeptical, and just a little more rational." He points to four pillars on which marketing depends: Product quality and reliability, styling, advertising, and competitive prices.

Electrical Appliance Sales Gain over Last Year's

At the end of nine months, sales of electric ranges, water heaters, dishwashers, and waste disposers topped last year's pace. Here's the National Electrical Manufacturers' Association breakdown:

	Units Sales, January-September	
	1961	1960
Electric Refrigerators	2,647,700	2,709,300
Freezers	820,791	844,000
Ranges	1,172,500	1,162,100
Water Heaters	571,000	553,800
Dishwashers	430,600	417,100
Waste Disposers	609,000	581,600
Dehumidifiers	360,000	391,300
Room Air Conditioners	1,369,200	1,378,100

When Should You Rebuild Machines?

An old machine tool is rebuilt at Cloyes Gear & Products Co., Cleveland, if the job won't run more than 50 per cent of the cost of a new machine. The gear firm says rebuilding is an important part of quality control. A program of periodic machine tests and checks enables the company to spot parts that need rebuilding and keep product quality high. For tips on how it is done, see Page 106.

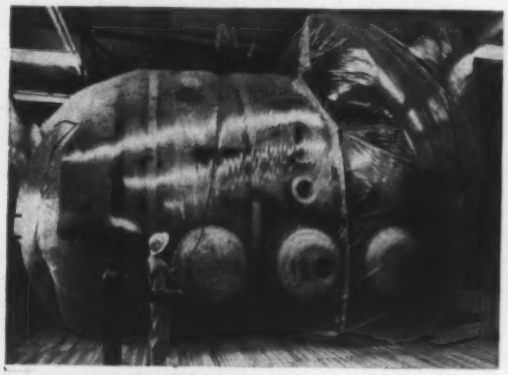
Canada's Economy Is Slowing, Say Purchasing Agents

Canada's economic growth appears to be slowing, says the Canadian Association of Purchasing Agents. October production was up in 30 per cent of companies replying in a survey, about the same in 55 per cent, and down in 15 per cent. Most companies are buying for immediate or for 30 day needs. Employment and prices appear to have leveled.

Chemical Industry Could Double Sales by 1970

Chemical industry sales could exceed $54 billion by the end of this decade, predicts Gen. John Hull, president, Manufacturing Chemists' Association Inc. That mark would be 95 per cent greater than 1960 sales of $27.7 billion. General Hull points out that the industry would have to maintain its "above normal" growth rate of about 7 per cent a year to meet the projection.

Testing Chamber Is Checked Out



Enclosed in a polyethylene bag filled with helium, this chamber is being pumped down to a vacuum equal to that at an altitude of 246 miles. Analysis of pump exhaust for traces of helium proves the chamber can hold the vacuum required for testing full sized satellites and space capsules. The chamber is part of Bendix Corp.'s new $10 million space laboratory at Ann Arbor, Mich.

Predicts Increase in Sales of Forgings

W. A. Carlile Jr., president, Drop Forging Association, believes that sales of forgings in the first half of 1962 should be substantially higher than those in the first half this year. He bases his prediction on the "indicated course

STEEL The Metalworking Weekly

November 27, 1961 Vol. 149 No. 22

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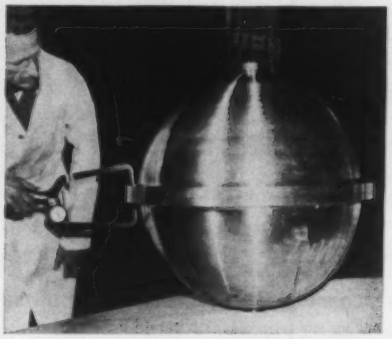
of business in general." Says Mr. Carlile: "The feeling of hesitation that was retarding business a year ago has been replaced by an awareness that the people of this country want goods and services in unprecedented volume."

Stainless Steel Spheres Plumb Ocean Depths

On the ocean's bottom, pressures that reach 16,000 psi greatly intensify the effects of salt water corrosion. To protect undersea research instruments, the Naval Ordnance Laboratory uses 30 in. stainless steel spheres built by the Standard Steel Div., Baldwin-Lima-Hamilton Corp. A technician is shown checking tolerances of flanges on mating halves of a sphere.



Straws in the Wind

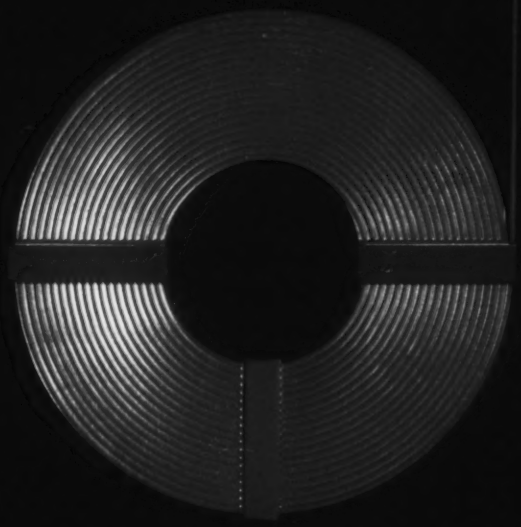
National Steel Corp. has been granted a patent for the production of columbium steel. Established markets are expected to take more than 2 million ingot tons annually by 1965, says Wilfred D. MacDonnell, president . . . More than 50 million lb of aluminum will be used in outdoor furniture during the coming year, predicts Kaiser Aluminum & Chemical Corp. . . . National Industrial Distributors' Association reports that October sales were 9.3 per cent above the September level. They topped the October, 1960, rate by 9.6 per cent . . . Business failures were 8 per cent heavier in October than they were in the year ago month, but the uptrend from 1960 levels has slackened considerably, says Dun & Bradstreet Inc. . . . Residential installations accounted for more than half the installed value of unitary air conditioners last year vs. only 37 per cent of the total in 1956, notes the Air-Conditioning & Refrigeration Institute . . . More and more companies are reminding suppliers: "Don't send gifts to any of our people" . . . Detroit Tooling Association has signed a three year contract with two UAW locals. Key provision is the institution of a supplemental unemployment benefits pool plan.

Metalworking Pulse

The Business Trend: For the second successive week, STEEL's industrial production index held at 174 as minor gains and losses among the components balanced one another. **Autos:** With sales high and inventories low, the Thanksgiving holiday is not expected to cut output as much as in previous years. **Steel:** The ingot rate declined as a result of the holiday. It is expected to return to its former level in the following week.

- **INDUSTRIAL PRODUCTION INDEX**
  (1947-49=100)
  Week ended Nov. 18 . . . **174†**
  Year ago **151**
  Details on Page 87
- **PASSENGER CAR OUTPUT (UNITS)**
  Week ended Nov. 25 . . **125,000***
  Year ago **111,091**
  Details on Page 84
- **STEEL INGOT OUTPUT (TONS)**
  Week ended Nov. 25 **2,015,000***
  Week ago **2,037,000**
  Details on Page 138

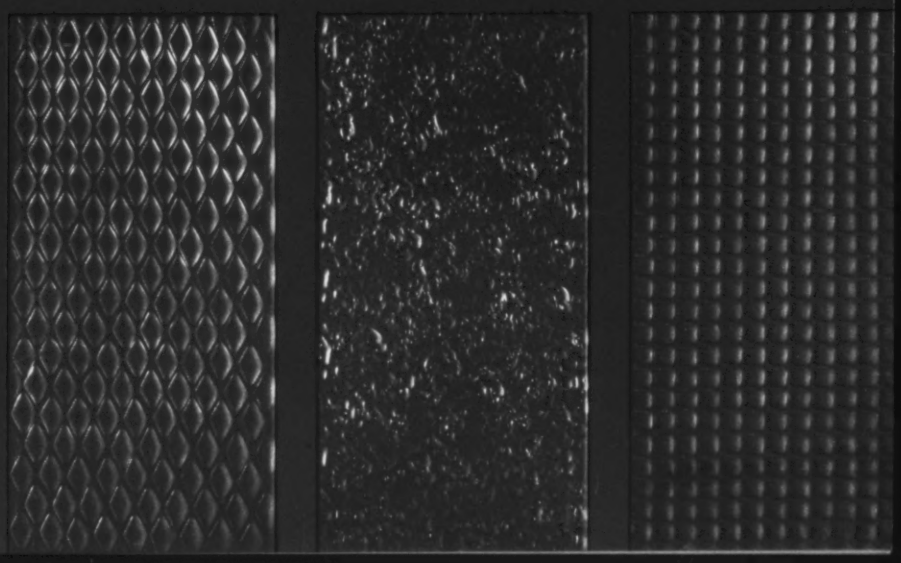
†Preliminary. *Estimated.

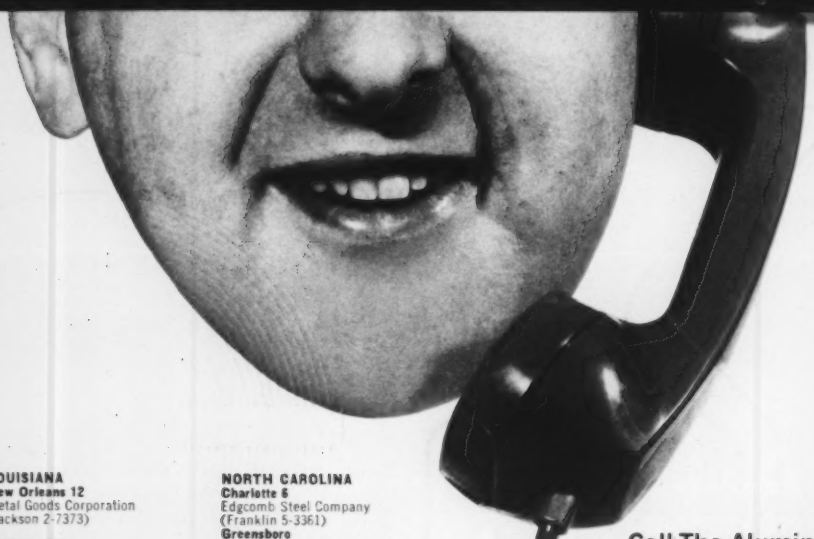


Widest Range from Any Distributor Source. Calling on your local Alcoa distributor for aluminum in all its forms is like having an Alcoa plant next door. Nobody else stocks as much sheet and plate; wire, rod and bar; tube and pipe; and extruded shapes in as many sizes, alloys and finishes. Nobody else can respond as quickly to your call for metal or technical advice.

ALCOA ALUMINUM

DISTRIBUTED NATIONALLY





ALABAMA
Birmingham 5
Hinkle Supply Company, Inc.
(Fairfax 2-4541)
The J. M. Tull Metal & Supply Co., Inc.
(Fairfax 3-1612)
ARIZONA
Phoenix
Ducommun Metals & Supply Co.
(Bridge 5-4471)
Pacific Metals Company, Ltd.
(Alpine 8-7821)
CALIFORNIA
Berkeley 10
Ducommun Metals & Supply Co.
(Thornwall 1-1820)
Los Angeles 59
Benjamin Metals Company
(Rod & Bar) (Nevada 6-0611)
Los Angeles 54
Ducommun Metals & Supply Co.
(Ludlow 8-9161)
Los Angeles 22
Pacific Metals Company, Ltd.
(Raymond 3-5431)
Los Angeles 22
Tubesales (Tube & Pipe)
(Raymond 3-7781)
San Diego
Ducommun Metals & Supply Co.
(Gridley 7-3141)
San Diego 1
Pacific Metals Company, Ltd.
(Belmont 4-3253)
San Francisco 7
Pacific Metals Company, Ltd.
(Underhill 3-5600)
COLORADO
Denver 16
Marsh Steel & Aluminum Co.
(Keystone 4-1241)
Denver 16
Metal Goods Corporation
(Dudley 8-4141)
CONNECTICUT
Milford
Edgcomb Steel of New England, Inc.
(Trinity 4-1631)
Windsor
Whitehead Metals, Inc.
(Murdock 8-4921)
FLORIDA
Jacksonville 5
The J. M. Tull Metal & Supply Co., Inc.
(Evergreen 7-5561)
Miami
The J. M. Tull Metal & Supply Co., Inc.
(Oxford 6-0150)
Tampa 10
The J. M. Tull Metal & Supply Co., Inc.
(3-6741)
GEORGIA
Atlanta 2
The J. M. Tull Metal & Supply Co., Inc.
(Jackson 5-3871)
HAWAII
Honolulu 14
Aluminum Products Hawaii, Ltd.
(94-861)
IDAHO
Boise
Pacific Metal Company (3-6468)
ILLINOIS
Chicago 80
Central Steel and Wire Company
(Republic 7-3000)
Chicago 80
The Corey Steel Company
(Bishop 2-3000)
Chicago 23
Steel Sales Corporation
(Bishop 7-7700)
INDIANA
Indianapolis 18
Steel Sales Co. of Indiana, Inc.
(Liberty 6-1535)
KANSAS
Wichita
Marsh Steel & Aluminum Co.
(Whitehall 2-3231)
KENTUCKY
Louisville 3
Williams and Company, Incorporated
(Juniper 3-7781)

LOUISIANA
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(Jackson 2-7373)
MARYLAND
Baltimore 7
Whitehead Metals, Inc.
(Windsor 4-2000)
MASSACHUSETTS
Boston 19
Eastern Metal Mill Products Co.
(Highlands 2-5900)
Cambridge 39
Whitehead Metals, Inc.
(Trowbridge 6-4680)
MICHIGAN
Detroit 12
Central Steel and Wire Company
(Twinbrook 2-3200)
Detroit (Hazel Park)
Meier Brass & Aluminum Co.
(Jordan 6-3902)
Detroit 10
Steel Sales Co. of Michigan
(Tyler 6-3000)
MINNESOTA
Minneapolis 13
Steel Sales Co. of Minnesota
(Sterling 1-4893)
MISSOURI
North Kansas City 16
Marsh Steel & Aluminum Co.
(Grand 1-3505)
North Kansas City 16
Metal Goods Corporation
(Grand 1-3516)
St. Louis 14
Metal Goods Corporation
(Harrison 7-1234)
St. Louis 10
Steel Sales Co. of Missouri, Inc.
(Prospect 1-5255)
NEW HAMPSHIRE
Nashua
Edgcomb Steel of New England, Inc.
(Tuxedo 3-7731)
NEW JERSEY
Elizabeth
Adam Metal Supply of New Jersey
(Flanders 1-2550)
Englewood
Tubesales (Tube & Pipe)
(Lowell 7-4400)
Harrison
Whitehead Metals, Inc.
(Humbolt 5-5900)
Hillside 5
Miller Steel and Aluminum
Division of Robert Campbell Co., Inc.
(Waverly 6-6000)
NEW YORK
Buffalo 5
Brace-Mueller-Huntley, Inc.
(TR 7-8700)
Buffalo 7
Whitehead Metals, Inc.
(TR 6-3100)
New York (Long Island City 1)
Adam Metal Supply
(Stilwell 6-7737)
New York (Brooklyn)
Strahs Aluminum Company, Inc.
(Browning 2-7000)
New York 14
Whitehead Metals, Inc.
(Watkins 4-1500)
Rochester 5
Adam Metal Supply of Rochester
(Locust 2-4260)
Rochester 1
Brace-Mueller-Huntley, Inc.
(Congress 6-6560)
Rochester 10
Whitehead Metals, Inc.
(Butler 8-2141)
Syracuse 1
Brace-Mueller-Huntley, Inc.
(Howard 3-3341)
Syracuse 1
Whitehead Metals, Inc.
(Howard 3-6241)

NORTH CAROLINA
Charlotte 6
Edgcomb Steel Company
(Franklin 5-3361)
Greensboro
Edgcomb Steel Company
(Broadway 5-8421)
OHIO
Cincinnati 14
Central Steel and Wire Company
(Avon 1-2230)
Cincinnati 37
Williams and Company, Incorporated
(Valley 1-5555)
Cleveland 28
A. M. Castle & Co.
(Axminster 2-7600)
Cleveland 14
Williams and Company, Incorporated
(Utah 1-5000)
Columbus 12
Williams and Company, Incorporated
(294-1623)
Toledo 12
Williams and Company, Incorporated
(Greenwood 5-8861)
OKLAHOMA
Tulsa 13
Metal Goods Corporation
(Temple 6-2561)
OREGON
Portland 9
Pacific Metal Company
(Capitol 7-0693)
PENNSYLVANIA
Philadelphia 34
Edgcomb Steel Company
(Garfield 3-6300)
Philadelphia 33
Metal Supply Company
(Center 6-0220)
Philadelphia 40
Whitehead Metals, Inc.
(Baldwin 9-2323)
Pittsburgh 33
Williams and Company, Incorporated
(Cedar 1-8600)
York
Edgcomb Steel Company (47-1931)
RHODE ISLAND
Slatersville
Edgcomb Steel of New England, Inc.
(Poplar 7-0900)
SOUTH CAROLINA
Greenville
The J. M. Tull Metal & Supply Co., Inc.
(Cedar 3-8366)
TENNESSEE
Memphis 6
Metal Goods Corporation
(Whitehall 8-3407)
TEXAS
Dallas
McCormick Steel Company
(CH 7-3104)
Dallas 35
Metal Goods Corporation
(Fleetwood 1-3271)
Houston 1
McCormick Steel Company
(OR 2-6671)
Houston 1
Metal Goods Corporation
(Riverside 7-1110)
UTAH
Salt Lake City 1
Pacific Metals Company, Ltd.
939 South 6th West
(Davis 8-2222)
WASHINGTON
Seattle 8
Ducommun Metals & Supply Co.
(Parkway 5-1500)
Seattle 4
Pacific Metal Company (Main 2-6925)
Spokane 4
Pacific Metal Company
(Keystone 5-3681)
WISCONSIN
Milwaukee 1
Central Steel and Wire Company
(Humboldt 1-5000)
Milwaukee 9
Steel Sales Co. of Wisconsin
(Hilltop 2-2020)

Call The Aluminum Man . . . his stock's the most complete!

Your Alcoa distributor sales representative—*The Aluminum Man*—maintains a warehouse bulging with sheet and plate; tube and pipe; extruded shapes; wire, rod and bar. His stock represents the widest range of aluminum products available from any distributor source. He can arrange for them to be slit, sawed or sheared to your specifications—furnish technical advice you may need on alloy selection and fabrication techniques. He's your fastest supply line for aluminum in any form when you need it. Your nearest Alcoa distributor is listed on this page, so give him a call . . . soon. Aluminum Company of America, 845-Y Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

DISTRIBUTED NATIONALLY

Call *The Aluminum Man* . . . he's your Alcoa distributor sales representative

WITH A GISHOLT BALANCER

Gisholt MASTERLINE HS Balancer

Vertical or horizontal models for light-weight, high-speed parts.

Indicates unbalance vibrations of 2 micro-inches . . . options permit working to 1/4 micro-inch (.0000025").

Fast setup . . . easy calibration . . . complete plane separation . . . no special foundation or location required.

Gisholt has the largest line of production-proven balancers in the world . . . from which you can select the machine that best meets your needs.

Contact your Gisholt Representative or write for Catalog 1109D.

You trust an adding machine . . . it cannot err if the correct keys are punched. Balancing is different. You can go through all the correct motions and still come up with the wrong answers . . . *if* your equipment makes you rely on operator skill and judgment to determine unbalance angles and amounts.

Gisholt Balancers eliminate operator "guessing". Setup is fast . . . exact angles and unbalance readings in terms of actual correction methods used, are obtained electrically in 15 seconds or less. Integral correction equipment can be added to correct and inspect in the same handling.

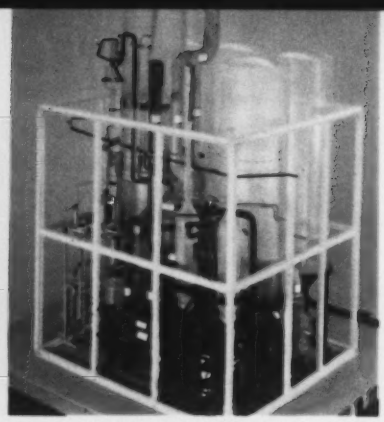
Don't let product quality and production efficiency depend on operator judgment. Learn how the accuracy, efficiency and *reliability* offered by Gisholt Balancers can help you do it for less.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U. S. A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

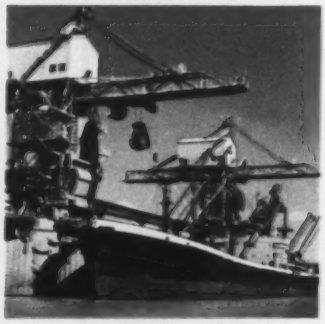
ILLINOIS: This Dravo-Lurgi sinter plant has rated capacity of 3900 tons per day. Over 45% of new U.S. sinter capacity added by steel industry in past five years are Dravo-Lurgi plants. A second Dravo-Lurgi pelletizing plant is being added for a large metal-producing company. Mail coupon for information on sintering, pelletizing, briquetting, beneficiation or other ore processing services.

MINNESOTA: Taconite shipping facility—2,334-foot dock, harbor and breakwater — built by Dravo on Lake Superior.



MICHIGAN: Engineering model of the cold box for 280-ton-per-day oxygen plant, now under construction for steel division of a major auto maker, will be first low pressure plant in U.S. to produce simultaneously gaseous and liquid oxygen without high pressure cycle. Dravo designs and builds air and gas separation plants under arrangement with Linde AG of Munich, Germany. Dravo turn-key services also include power and steam plants, water pumping and treatment stations, other plant utilities. Send the coupon for data.

LOUISIANA: Dravo-built twin unloaders and dock handle variety of materials at versatile ship/barge facility on Lower Mississippi. Rugged, efficient materials handling equipment can reduce costs of unloading ore, coal, other bulk commodities and containerized cargo for water-side plants and port installations. Send coupon for details.



PENNSYLVANIA: Dravo *Tru-weld* grating is produced by modern, highly automated equipment. It is used on all types of applications where open steel flooring and stairs are needed; is available direct or from distributors throughout U.S., in standard panels or fabricated. Check coupon for information.

NEW YORK: New forced air, stationary cooler, new sinter breaker, hot screening facilities and other plant modifications helped major steel producer improve sinter quality and production. Similar programs are underway for two other existing plants. Check coupon for information on stationary, induced-draft circular or straight-line coolers, breakers, screens or sinter plant modernization services.

Harbor in
Minnesota

Sinter Plant in
Illinois

Oxygen Plant in
Michigan

Unloaders & Dock in
Louisiana

Grating in
Pennsylvania

Process Modernization in
New York

Dravo Corporation, 4770 Grand Avenue, Pittsburgh 25, Pa

Please send me information on the following products and services

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☐ Water & Waste Treatment	☐ Oxygen Plants	☐ Shafts, Tunnels
☐ Ore & Coal Unloaders	☐ Mill Lubrication	☐ Water Intakes
☐ Sinter Plants & Coolers	☐ Turbo Blowers	☐ Steam Plants
☐ Pelletizing & Briquetting	☐ Space Heaters	☐ Fabricated Piping
☐ Oxygen Steelmaking	☐ Ore Bridges	☐ Grating

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

DRAVO

MATCHED!

MATCH YOUR INVENTORY TO INCOMING ORDERS . . . WITH A LOW-COST ROYAL McBEE SYSTEM TAILORED TO YOUR NEEDS.

Lower inventory levels mean higher profits. Stagnant stock costs you money. Spoilage, obsolescence, insurance, storage, taxes — when you tag these factors onto your original stock investment, they sometimes add up to as much as 25% of the inventory value. But low-cost Royal McBee systems give you the kind of up-to-the-minute data that keeps inventory at its lowest practical level. And the system is simple and speedy. It eliminates bothersome transcribing and auditing, reduces reference time to a minimum. With Royal McBee systems, stock-on-hand should seldom exceed — or fall short of — delivery requirements They're "matched."

Adaptable to the needs of any size plant. For over 50 years, our representatives have been solving inventory and other business problems with flexible Royal McBee equipment. Your nearby Royal McBee man will be glad to discuss a low-cost system tailored to your needs. Call him. Or write to us for information at 850 Third Avenue, New York 22, New York.

ROYAL McBEE CORPORATION

ROYAL
SPECIALISTS IN BUSINESS MACHINES

Since Allegheny Ludlum Stainless Steel provides the highest known sanitary protection, it easily meets the exacting requirements imposed on food plants by sanitary inspection laws. The spotless appearance of stainless equipment stresses the hygienic precautions that have to be maintained. Stainless Steel takes the constant rubbing, hosing-down and steam necessary for cleaning and maintenance.

Turn the page for the newest Allegheny Stainless developments for the food processing industry.

3609

These Newest Developments in Applying Stainless Steel Promise Lower Costs

Recent experiments prove lower cost 200-series stainless OK for Dairy Equipment

The dairy farm's current transition from the ten-gallon cans of milk cooling in the spring house, to a modern, refrigerated stainless steel bulk storage tank should gain momentum as the result of a test recently completed at The Pennsylvania State University, and the results should interest all food processors.

An experimental 205-gallon bulk milk tank, fabricated from a more economical, relatively new type of stainless, has proved successful in handling milk during a 3½ year service test at Penn State's milk production center.

Results suggest that Allegheny Ludlum Type 202 Stainless, in which manganese replaces much of the nickel as a component, can handle milk as efficiently and safely as the more expensive grades of stainless from which Penn State's other bulk tanks were made. It can also be cleaned and sanitized easily.

Reports state that the 3½ year old tank "remains in perfect condition, entirely free of pits or corrosion, stains or discoloration. The finish, on both the outside and inside, looks as good as new."

The Type 202 tank has behaved in every respect like Penn State's other tanks, which are made from the famous Type 302—18 percent chromium, 8 percent nickel stainless steel. Washed with a regular alkaline dairy cleaner, the "202" tank received cleaning service identical to the other tanks. Each was also cleaned weekly with a standard organic acid dairy cleaner to remove hard water deposits.

The Type 202 stainless maintained the high quality taste of the milk and did not affect the bacteria count, two of the most important considerations of dairy equipment. Any food processor following the same cleaning procedures should consider the Allegheny Ludlum originated 200-series, Stainless Steels as food for thought.

More local stocks of A-L Stainless

In the past several years, A-L has added additional distributors. For the names of the Steel Service Centers in your location who stock Allegheny Stainless just ask the A-L representative or call the district office.

Sanitation Studies show economical #2B or #3 finish stainless as bacteriologically cleanable as expensive #4 or #7.

Research recently completed at Michigan Agricultural Experiment Station, Michigan State University, concludes—"since there was no significant difference in the bacterial counts of the four finishes, it must be concluded that there is no difference in the relative cleanability of these four finishes and that any of these finishes should be satisfactory for dairy processing equipment from a sanitation standpoint."

By switching to a #2B finish, first costs of a piece of equipment can nearly be halved.

The project was supported in part by the American Iron and Steel Institute and the National Association of Dairy Equipment Manufacturers. A reprint of the study is available from any A-L representative or by writing to headquarters.

The research should be studied by everyone concerned with food processing equipment. 3609

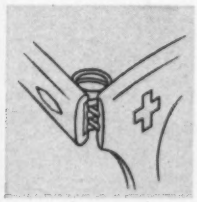
A-L's New Research Center offers assistance on any of your problems

Consolidated in one center is all of A-L's research personnel, probably the largest group in the specialty steel industry. The vast experience and knowledge of the pioneer producer of stainless steel is at your service.

AL ALLEGHENY LUDLUM Stainless Steel

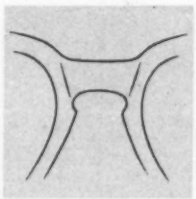
IT'S AS IF YOU DESIGNED THE Y-30 LINE

NEW *B&L Safety Glasses combine all the features you want most*

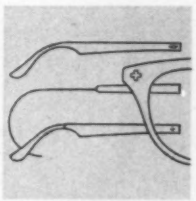


Mitre joint temples for easy fitting. No stronger hinge on the market.

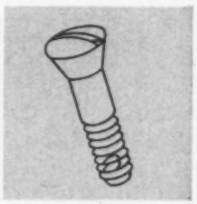
Front is cut from sturdy sheet acetate, stronger than molding.



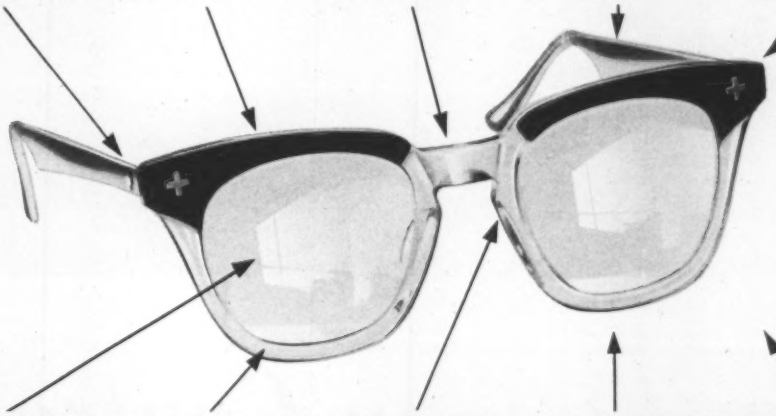
Keyhole bridge for comfortable, pressure-free nasal fit. All sizes.



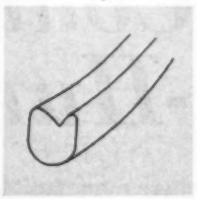
Crystal, flesh and aluminum temples, easily interchanged.



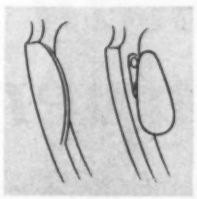
Re-usable Nylok temple screws insure temples always fitting snugly.



Bal-SAFE lens toughest on the market. Clear or 3 Ray-Ban shades, or clear Enduron hard resin.



Deeper, off-center buttressed eyewire groove, more than doubles lens retention.



Comfort assured by broad rigid or adjustable nose pads, easy to fit.

S-7 lens shape for smart good looks, unobstructed vision, extra safety.

Complete interchangeability: fronts, temples, lenses, screws.

Here's smart appearance, new strength, built-in comfort, sure economy. Good looks to win workers' esteem. Much stronger frames, including a deeper buttressed eyewire groove which more than doubles lens retention. Wearer comfort assured by Bausch & Lomb expertness in ophthalmic eyewear design. Complete interchangeability and other new features assure real savings in safety eyewear costs. Mail coupon today for full Y-30 information.

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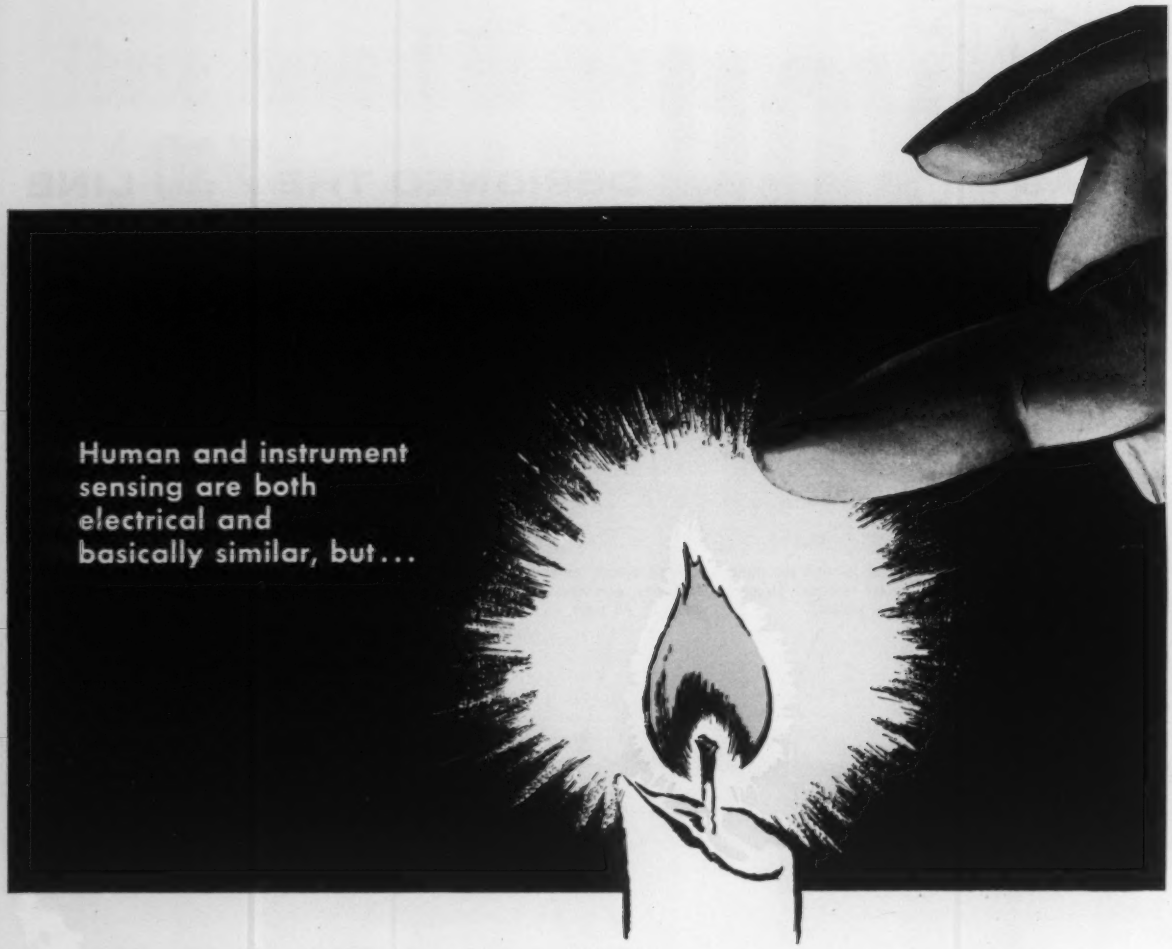

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Barber-Colman instruments probe where man can't go and convert electrical signals into controlling action. They precisely follow instructions without forgetting • Automatic, dependable, electronic self-balancing systems extend your process engineer's range and power. And, they monitor your process with a faithful hand — to your profit. • Process controls perform every function but fundamental decision-making. You could make one now. Ask your process people to call today.

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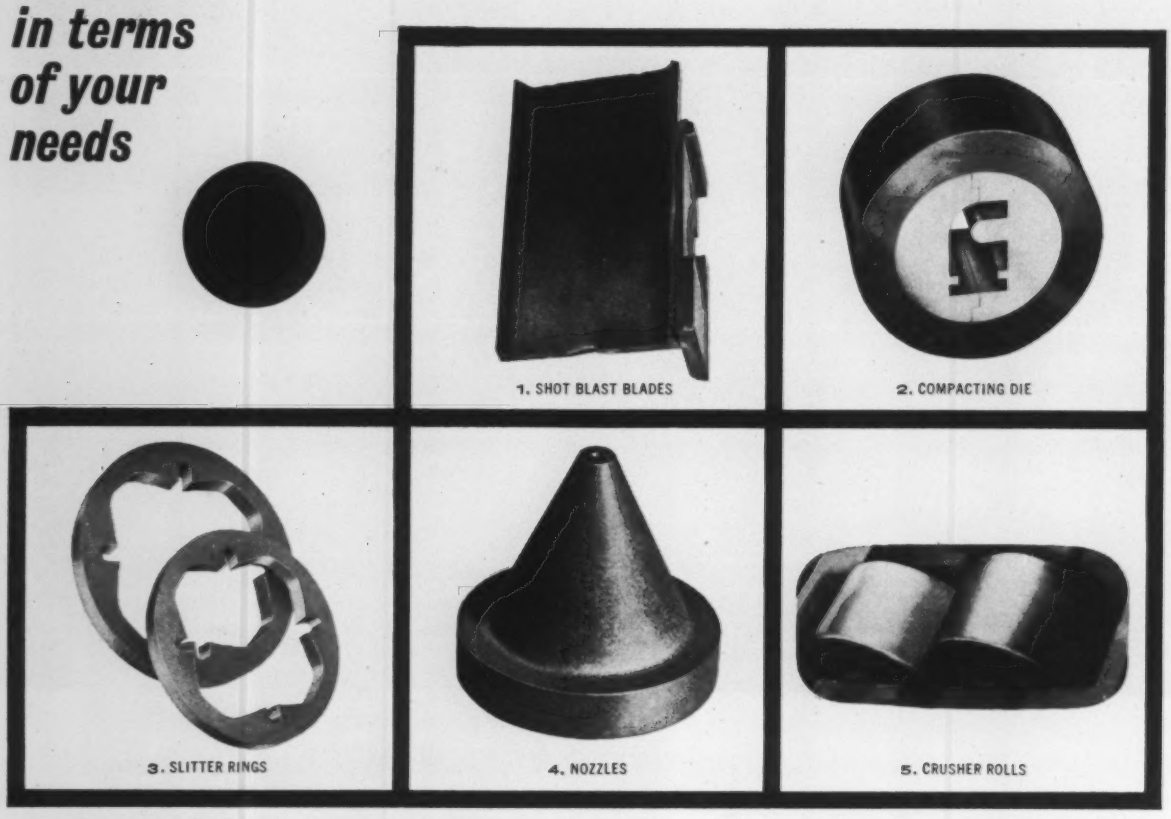
Small Motors • OVERdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

let's evaluate our carbides in terms of your needs



Ways to improve operations and save many dollars for your company may be found in a discussion with a Kennametal Carbide Engineer. He is specially trained in carbides—and *devotes his time exclusively* to applying Kennametal* hard carbides in metalworking tools and for making machine components that normally wear out rapidly.

Kennametal hard carbides are the answer to a wide range of applications where resistance to abrasion and wear is a major factor as they last up to 100 times longer than hardened steel. Other outstanding properties are resistance to corrosion; high hardness; high torsional, compressive, and tensile strengths; and high rigidity—three times that of steel.

Some interesting applications are:

1 Kennametal shot blast blades, whirling highly abrasive grit, had about 40% life remaining after 5,189 hours. Steel blades lasted an average of only 140 hours.

2 Compacting die of Kennametal, used to produce ceramic components for electrical equipment, showed no signs of undercutting from abrasion after turning out 1,000,000 pieces.

3 When a can manufacturer replaced steel slitter rings with rings of Kennametal, sheet stock was slit to accurate size without burrs; production was increased to 500-700 cans per minute, and down time was reduced.

4 Kennametal hard carbide nozzles, used in spraying sealing material on can lids, outlast stainless steel nozzles 18 to 1 and reduce rejects by permitting use of higher pressures.

5 Crusher rolls of Kennametal reduce extremely hard abrasive material from ¼-inch mesh particles to 200-230 mesh—averaging a full year of five days a week, 16 hours per day, between roll dressings. Hardest steel rolls required resurfacing every few hours and had to be replaced every several days.

Kennametal properties such as these, plus our creative research and development activities, are helping to translate ideas into vital machine components to provide longer life and improve production in many industries.

For further information, call your nearest Kennametal Representative—or write for Booklet 666, "Proven Uses of Kennametal and Kentanium," which describes over 80 successful applications of these hard carbide alloys. KENNAMETAL INC., Dept. ST, Latrobe, Pa.

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FABRICATED SCREEN SECTIONS TO FIT EVERY VIBRATING SCREEN MADE

Tyler fabricates screen sections to fit every existing type of vibrating screen. This aggregate cloth is drawn from inventory, quickly fabricated to give you fast delivery. Tyler-developed hook strips maintain drum-head tension for long service life.

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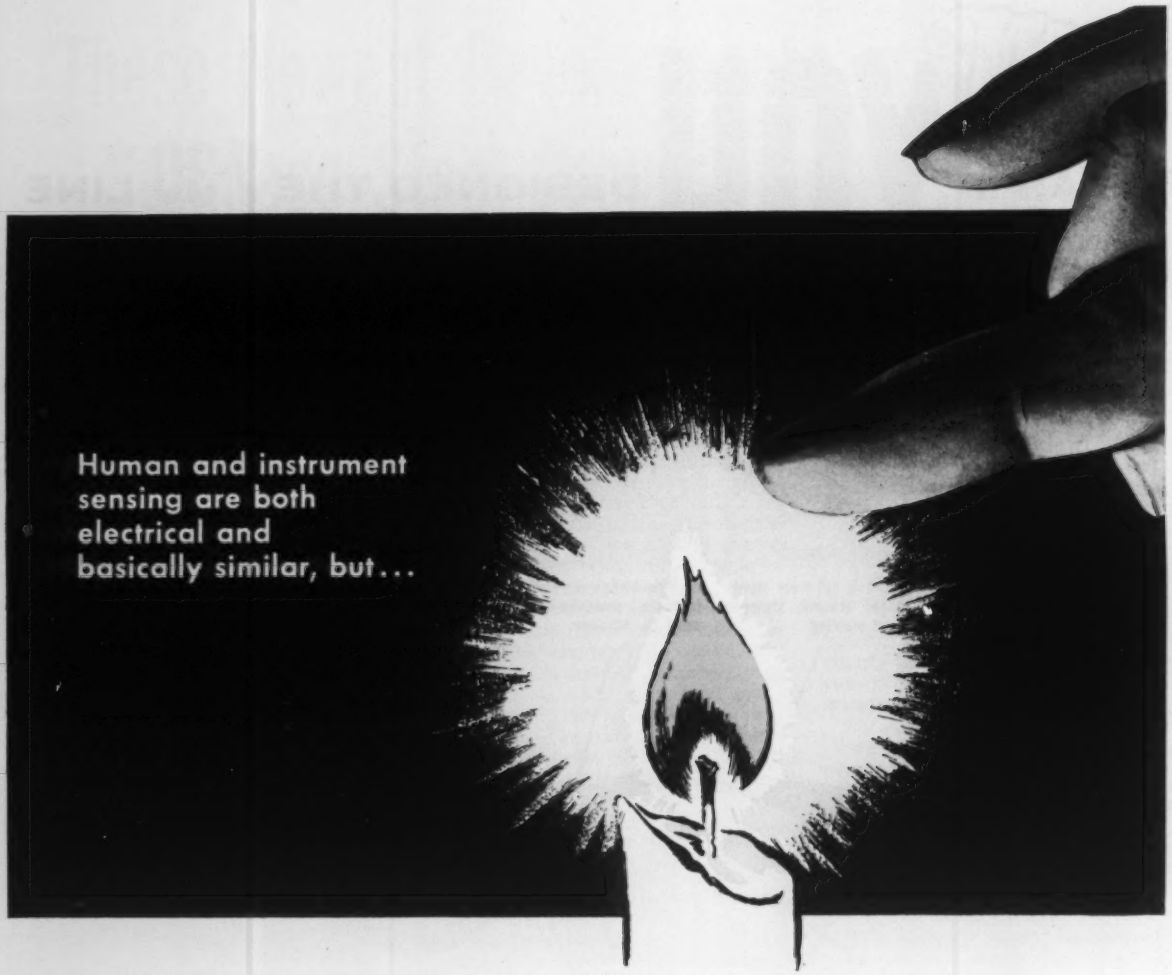

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Control Center in plant manufacturing transistors. All controls can be brought to the most efficient operating location. Centers are designed, assembled, and prewired.

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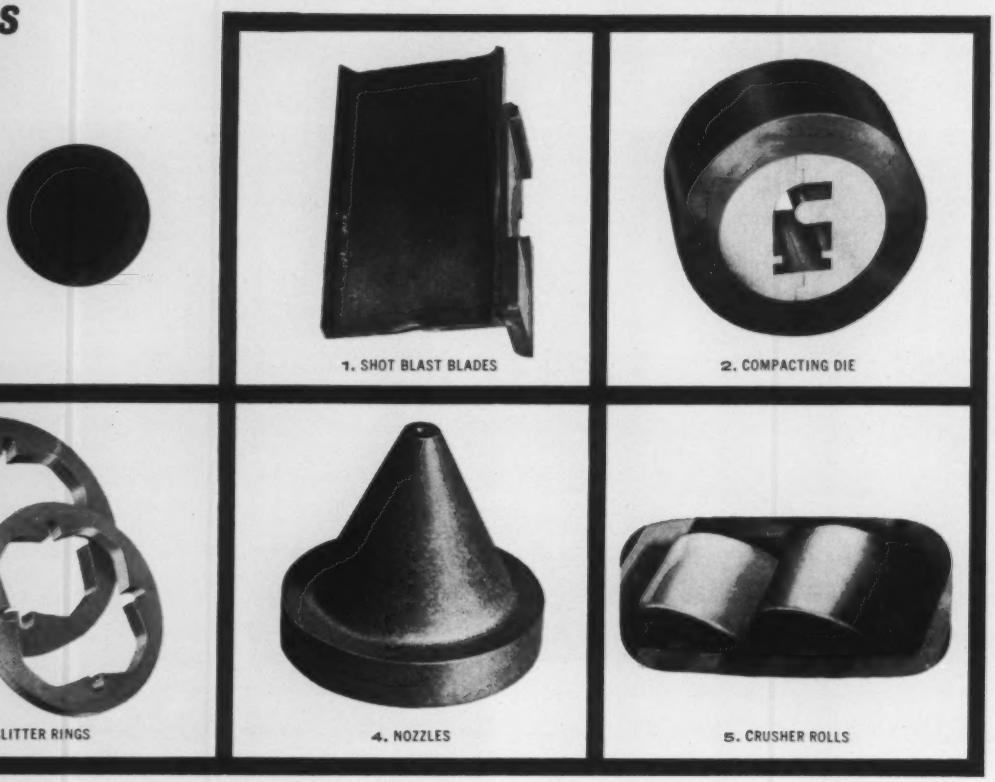

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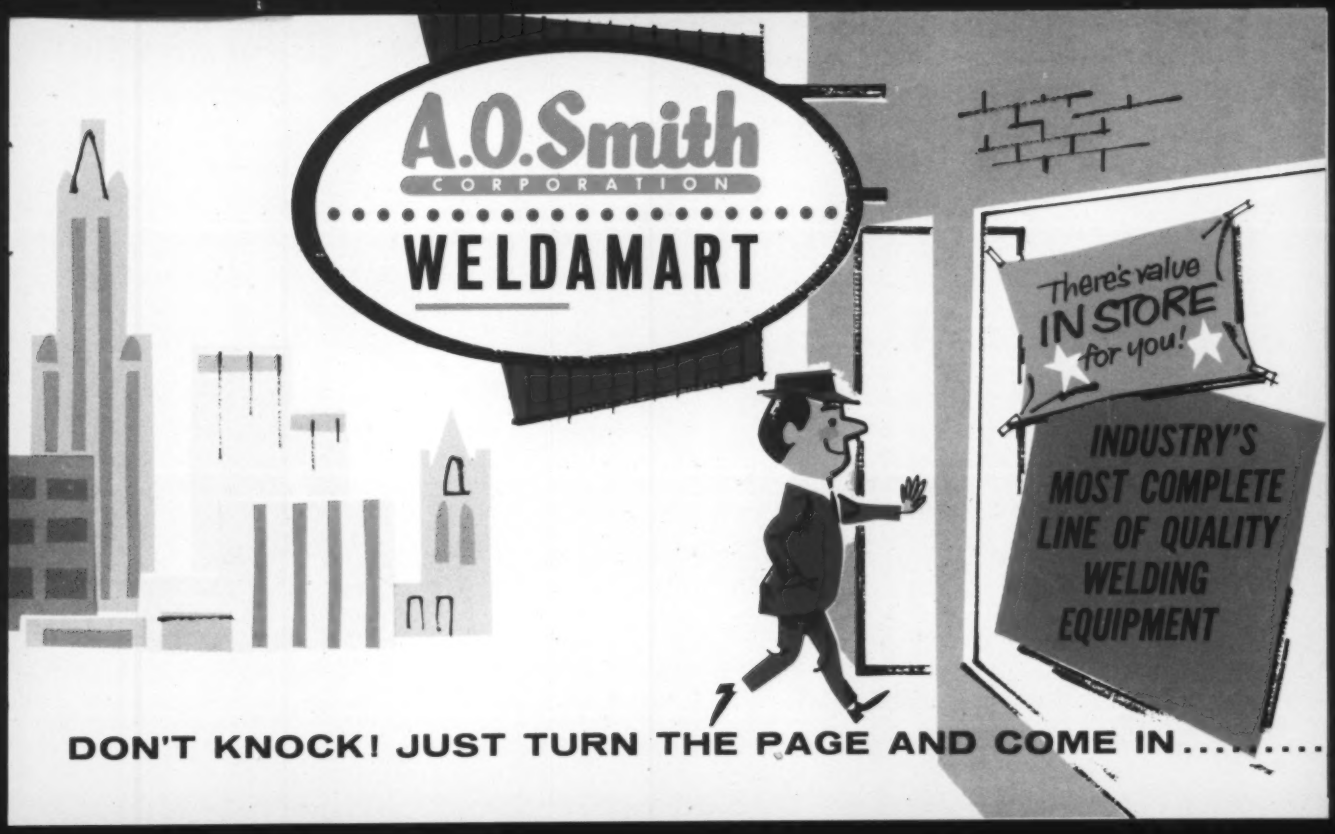
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HERE'S **ONE-STOP SERVICE**

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OVER 70 DIFFERENT TYPES OF **ELECTRODES**

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New A. O. Smith SW610 out-performs any electrode in the E6010 class. Send for free sample or get in touch with the A. O. Smith representative or distributor near you.

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Semi-automatic & automatic welding equipment
High-speed automatic package that's easy to set up, easy to use. For all types and sizes of consumable electrode wire used for automatic welding, gas-shielded processes.
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Complete packages to suit any semi-automatic welding needs. Choice of four power sources, three wire drive units and four hand guns. Also special Button Weld timer for light-gauge arc spot production welding.

Proven the Nations Top A.C. Welder
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You get all this: Famous moving coil design . . . easy adjustment . . . full 80-volts open circuit voltage . . . full current output in a single range . . . space-saving, low-boy design . . . easy "add-on" accessories including D.C. conversion. This versatile machine is available in 300, 400 and 500-amp models.
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All A. O. Smith welding machines are guaranteed to provide for free replacement of any part that fails due to defective workmanship or material within one year from date of purchase.

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D.C. CONVERTERS — 250 and 450-ampere units convert any A.C. welder in your shop into a D.C. rectifier. Full 60% duty cycle. They're compact, easily portable, safe and simple to set up.

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200, 300 400 amp output

SUPER SILICON RECTIFIER — You work with the exact arc characteristics you need at your fingertips: Forcing arc for heavy arc penetration . . . smooth arc for light sheet . . . arc booster for hard to start electrodes. (Also available with selenium rectifiers.)

DUAL-DUTY

MODEL A6500AD A.C./D.C. WELDER — For A.C. and heavy iron powder electrodes or on D.C. manual submerged-arc units. An extremely wide current range allows you to use it with any size electrode. Optional built-in circuits enable it to be used with manual submerged-arc units.

AISLE 4
gas drives and multiple-operator units
Here's the ultimate in dependable power for A.C. or D.C. inert arc welding offering handy, easy setting and control. All models (200, 300, 500 amp) are high-frequency units with gas, spot gun controls as accessory equipment.
2 AND 4 WHEEL TRAILERS AVAILABLE
LIQUID-COOLED
FOR INERT GAS WELDING
FOR SPOT GUN
FOR METALLIC ARC WELDING
A.O. Smith
AC-DC ARC WELDER
BUG
You can really go places with A.O. Smith D.C. gas drives. They're both air- and liquid-cooled featuring optional electric start, meters, dual arc reactors. All have simplifed controls to speed the job . . . extreme arc stability . . . longer unit life and reduced operating costs. Choose from air-cooled 200 amp "Bug" and three liquid-cooled models (200, 300, 400 amp).

Multi-Operator Welding Systems
D.C. CONSTANT POTENTIAL MACHINES—Using standard resistance grids, many users report up to 30 welders working from one power source. They're designed to augment or replace cumbersome and troublesome motor generators as well as for new applications. Available in 500, 750 or 1500 amps for construction, ship building and similar applications.
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NEW WELD-ALL TWO-TWENTY-FIVE FOR LIGHT INDUSTRY, MAINTENANCE AND FARM WELDING
Built-in battery charger is handy accessory item. Does double-duty by quick-charging six-volt and twelve-volt batteries in less than an hour-and-a-half — starting charge in 20 minutes. No fuss! To install, just bolt panel in place.
DO-IT-YOURSELF SECTION
MODEL A20S SHOP WELDER — Ideal for parts fabrication and equipment repair. Rated at 200 amps, 50% duty cycle . . . 250 amps, 35% duty cycle...295 amps, 20% duty cycle. 80-volt open circuit voltage assures easy striking and running with all A.C. electrodes. Battery-charging accessory also available.
Here's a "cooperative" welder — one that will iron out difficulties and make the "tough" jobs easy. It does all this: Handles all types of steel . . . accommodates a wide range of electrodes . . . packs a record 225 amps of welding power . . . provides two welding ranges . . . gives exact, stepless current control.
A.O.Smith A.C. WELDER

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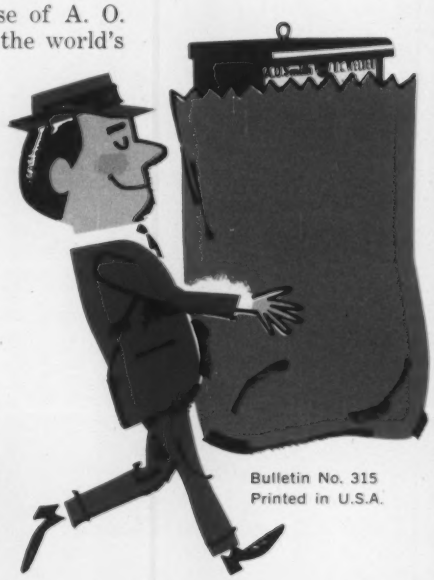
Why pay your money and take a chance when A. O. Smith gives you your choice — a *value* choice of industry's most complete line of welding equipment and electrodes.

Let's spend some time with that word *value*. In the case of A. O. Smith, value begins at home. Because A. O. Smith is one of the world's largest single users of welding equipment in its own production lines — its research and development efforts are far more extensive than those of other welding equipment manufacturers.

In our tour through the A. O. Smith Weldamart, we have shown you only the high points in the A. O. Smith line. There are hundreds of variations on the equipment shown here. For specific information, write us direct or visit your A. O. Smith welding distributor.



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WELDING PRODUCTS DIVISION
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Bulletin No. 315
Printed in U.S.A.

FABRICATED SCREEN SECTIONS TO FIT EVERY VIBRATING SCREEN MADE
Tyler fabricates screen sections to fit every existing type of vibrating screen. This aggregate cloth is drawn from inventory, quickly fabricated to give you fast delivery. Tyler-developed hook strips maintain drum-head tension for long service life.

SAMPLES OF SCREENED MATERIALS MAY ANSWER YOUR SEPARATING PROBLEMS
The Tyler Customer Service Laboratory keeps on file data and samples from years of evaluating screening problems. When you have a new application, check Tyler for technical recommendations based on experience and thorough evaluation.

Wire cloth so finely woven it screens out light!

Openings in this woven wire cloth are so tiny they're specified in microns—millionths of an inch. This is Tyler stainless steel wire cloth, 325 x 2300 mesh, used in filtering fuel in aircraft engines. Whatever your special needs in wire cloth, Tyler can supply you from the world's broadest line—covering thousands of different specifications.

TYLER CUTS YOUR COST OF SCREENING

• Requirements matched from world's broadest line of wire cloth • Fast shipments from the industry's largest inventory • Technical service backed by unique Customer Service Laboratory.

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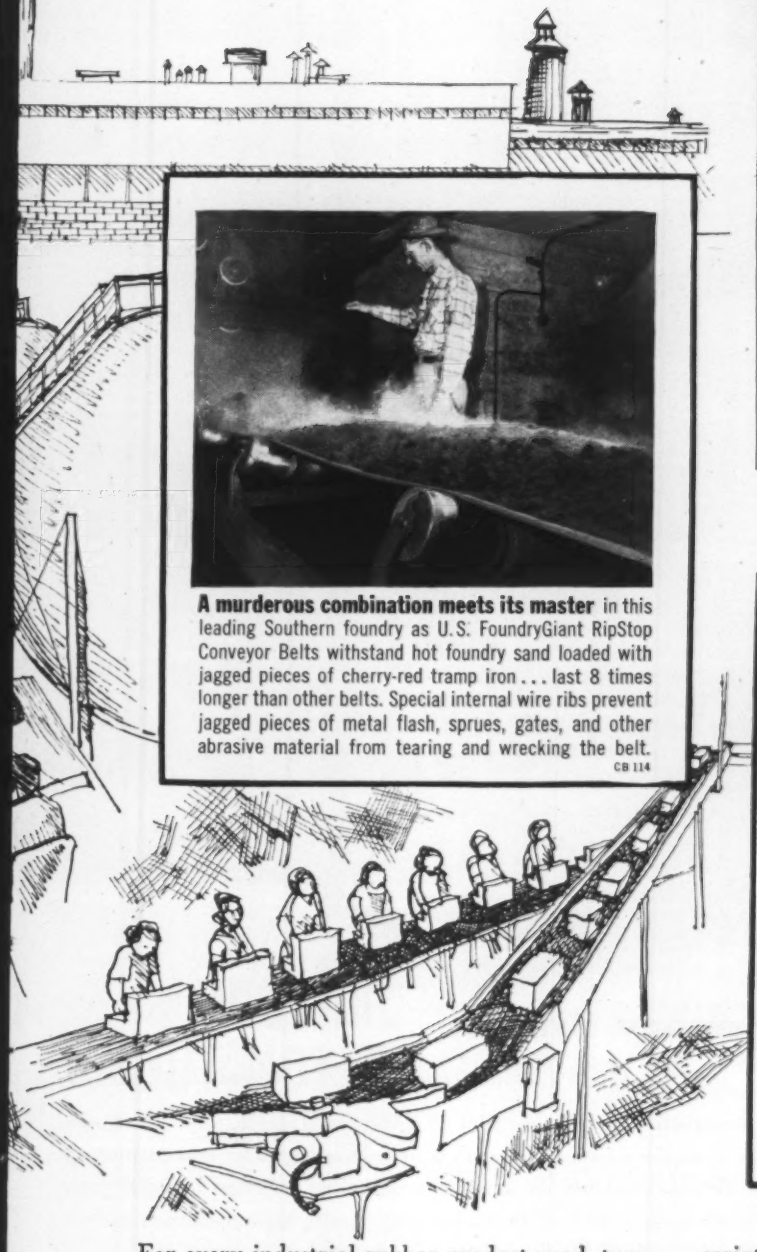
AT THE HEART OF INDUSTRY...

Live steam, inches away — yet this man's safe, next to the hose that death-causing steam cannot burst. U. S. Matchless® Steam Hose has its own built-in safety device. When it's ready for replacement, the wire-braid construction prevents it from bursting. Instead, just a wisp of steam seeps through, letting you know it's time for a new hose.

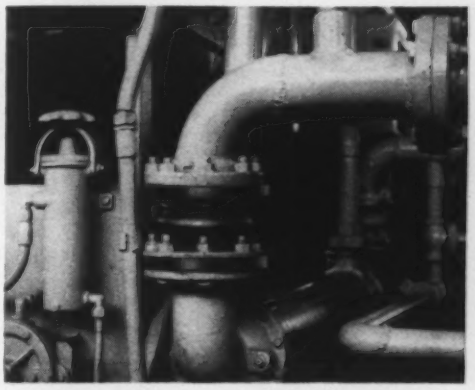
H 109

Leaders of industry maintain high standards with the help of US Industrial Rubber Products. These valuable production tools combine all the qualities industry demands—proven efficiency, faithful performance and minimum maintenance. No wonder US is the world's largest producer of industrial rubber products.



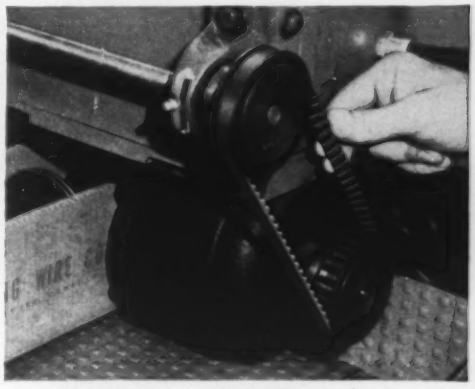
A murderous combination meets its master in this leading Southern foundry as U.S. FoundryGiant RipStop Conveyor Belts withstand hot foundry sand loaded with jagged pieces of cherry-red tramp iron . . . last 8 times longer than other belts. Special internal wire ribs prevent jagged pieces of metal flash, sprues, gates, and other abrasive material from tearing and wrecking the belt.

CB 114



Absorbing expansion and contraction forces before they can damage piping and equipment, tough US Expansion Joints compensate for misalignment and soak up vibration as well. Their ability to contain pressures, to serve as a permanent, maintenance-free part of the piping system is indicated by the fact that they are often painted over with the rest of the equipment.

EJ 102



Because uniform speed is the need, Viking Wire Company uses US PowerGrip "Timing"® Belts exclusively on its wire-drawing machinery. These maintenance-free, noiseless belts are used in two critical production steps for enameled wire. They permit a constant long-length draw of wire through forming dies, and close speed control in enameling ovens.

TB 111

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MECHANICAL GOODS DIVISION

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Producers of alloys, metals and chemicals

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NEU-TRI® solvent, Dow's super-stable *neutral* trichloroethylene for vapor degreasing, maintains its safety and effectiveness over long periods. Under heavy work loads or adverse operating conditions, a built-in, neutral-stabilizing system keeps NEU-TRI free of acids and other corrosive chemicals for an extended time.

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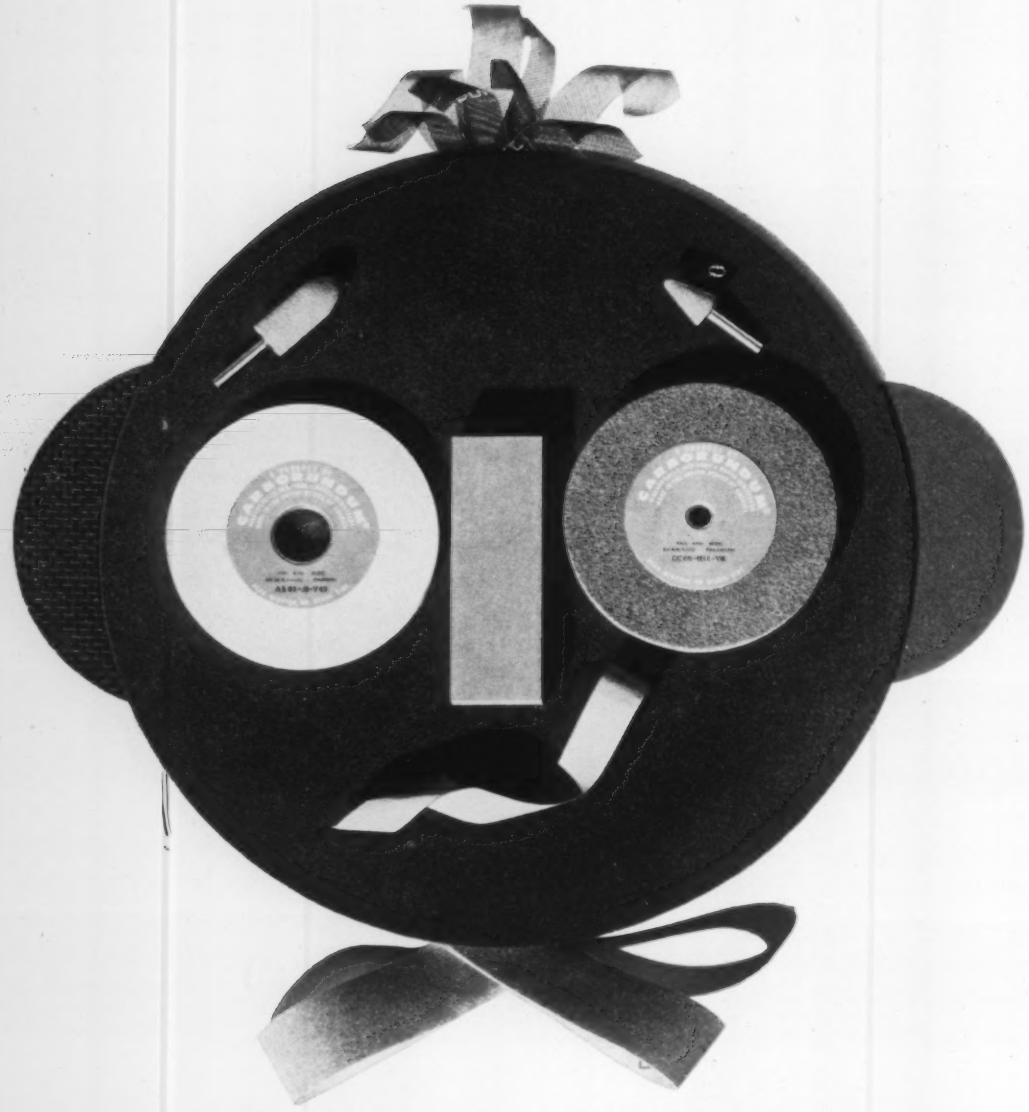
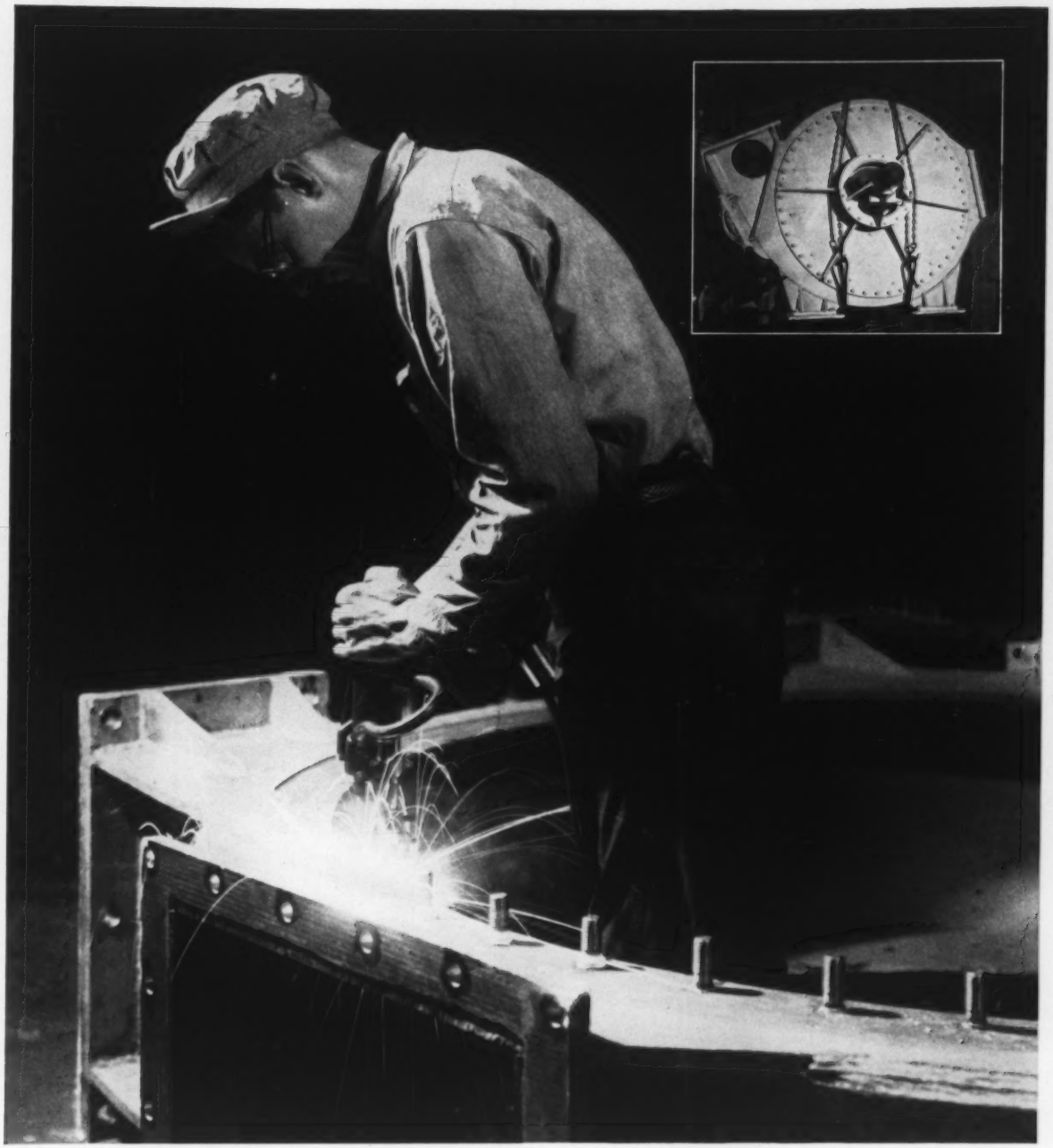
THE DOW CHEMICAL COMPANY DOW Midland, Michigan

ABRASIVE SELECTION HAVE YOU CONFUSED?



Turn to National Standards by Carborundum for the answer!

There is no reason to get tangled in complicated abrasive selection problems... Carborundum's Catalogs of National Standards make selection and pricing easy. Selecting National Standards can also save you money: you have lower inventory requirements for your plant... fewer purchasing and stocking problems... no large inventories of custom-formulated items. Complete local stocks are maintained based on your trading area requirements. You have minimum delivery problems... National Standard abrasives are shelf items awaiting your order. What's more, they are performance proved throughout industry—outperform most custom-formulated products time and time again. National Standards by Carborundum offer a full range of grinding wheels, diamond products, coated abrasives and industrial specialities. Your guides to Standards are: Catalog 1489, National Standard Grinding Wheels and Industrial Specialities—Catalog 1555, National Standard Abrasive Belts, Rolls, Sheets and Discs. If you don't already have your copy, phone your Carborundum distributor or factory representative now. Niagara Falls, New York. **CARBORUNDUM**



FASTENING TIME CUT 80% WITH NELSON® STUD WELDING

Bearing plates for these 9-ton coal pulverizer exhaust casings are fastened 80% faster with Nelson Stud Welding... and expensive material handling is eliminated. Threaded studs, ⅞" in diameter, are end-welded at a rate of 4 to 5 per minute. That's real speed—especially when compared to the 2 to 4 minutes each it takes to drill, tap and set threaded stud bolts. It's easy to see how Nelson Stud Welding cuts costs, increases production. With stud welding, all the work is done on one side—without warping or damage. Heavy bosses are not needed since there's no need to provide tap depth. And because there are no holes in the base material, there is no possibility of leaks in water and oil-tight units. Take the tool to the work... get greater design flexibility and lower material handling costs. Nelson studs are available in diameters from ¼" to 1" for all types of applications.

For application ideas, design recommendations and full method information, send for the Nelson "Design Manual". **NELSON STUD WELDING,** Division of Gregory Industries, Inc., Department S, Lorain, Ohio.

GREGORY INDUSTRIES

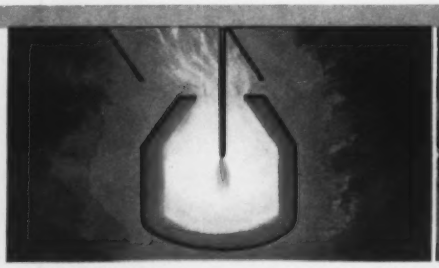
NATIONAL STEEL'S MILL OF

This new 80-inch hot-strip mill at Great Lakes Steel in Detroit—the fastest, most powerful in operation today—advances the art and science of rolling steel a giant step forward. It sets new standards for efficiency while providing auto body sheets and other sheet steels of the highest, most uniform quality yet produced.

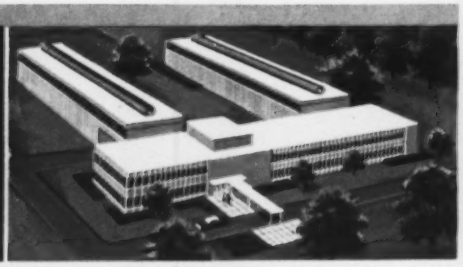
Here's how the Mill of the Future goes about it: Four slab reheating furnaces—the largest ever built—feed the new mill. Together, these furnaces have a capacity of 1,000 tons of 30-foot-long steel slabs every hour. The rolling process itself will be masterminded and controlled by the mill's closed system computer. Coming up with as many as 44,000 computations a minute, it will monitor quality at 200 points along the 2,000-ft. line—keeping thickness, width and temperature right on target at all times. The outcome: giant economy size coils—up to 74 inches wide, 72 inches in diameter and weighing up to 70,000 lbs.—to help manufacturers make their own production more economical.

This 80-inch mill is only one accomplishment in a program of

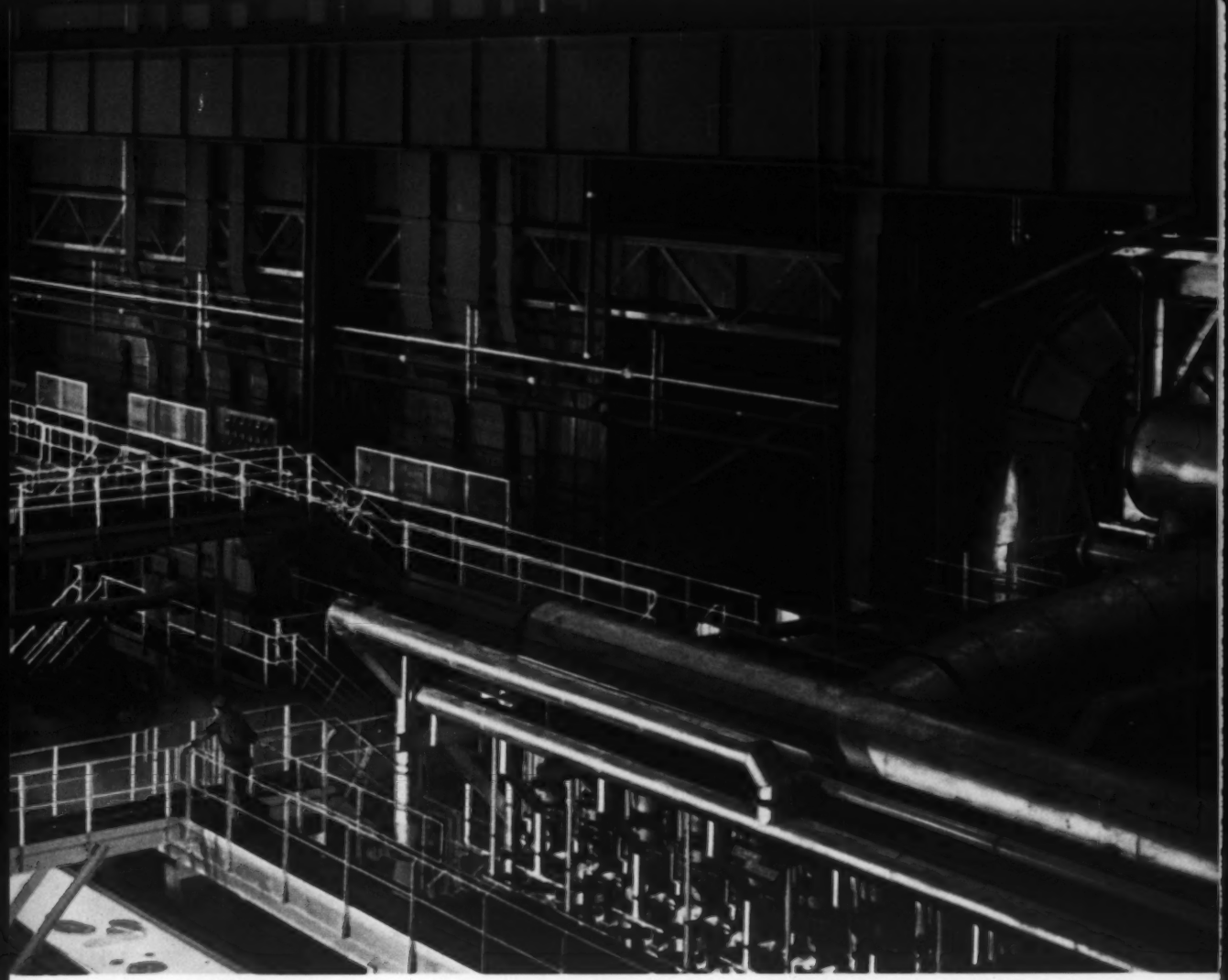
FIVE OTHER MAJOR STEPS TO FURTHER PROGRESS



NEW BASIC OXYGEN FURNACES at Great Lakes Steel. To be completed in 1962, two basic oxygen furnaces—the largest ever built—which will add new capacity and greater efficiency.



OUR NEW RESEARCH CENTER will be National Steel's headquarters for the expanded, continuing exploration of new and better raw materials, facilities, manufacturing processes and products of steel.



THE FUTURE IS NOW ROLLING

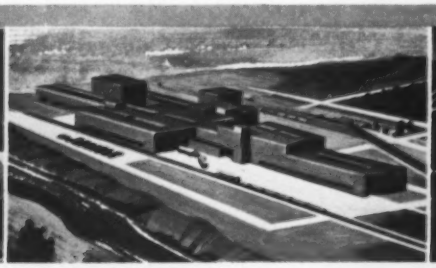
expansion and improvement in which National Steel is investing well over $350,000,000. Among the program's far-ranging benefits: higher efficiency and greater stability throughout our operations, with better, more secure jobs for our employees; a better supply of the highest, most uniform quality steel for our customers; and better values for you, the ultimate consumer of the million and one products made of steel. Other phases of this program will swing into action soon. And we will be bringing you news about them, too.

NATIONAL STEEL CORPORATION, PITTSBURGH, PA.

SUBSIDIARIES AND DIVISIONS:

GREAT LAKES STEEL • WEIRTON STEEL • MIDWEST STEEL • STRAN-STEEL • ENAMELSTRIP • HANNA FURNACE • NATIONAL STEEL PRODUCTS

AT STRAN-STEEL in Terre Haute, new finishing-line facilities are boosting quality and output of popular color-coated steel panels for Stran-Steel's handsome new line of contemporary pre-engineered buildings.



AT MIDWEST STEEL near Chicago, the most modern and efficient steel finishing plant in existence is now providing industry with the finest quality galvanized sheets, tin plate and hot- and cold-rolled sheets.

AT WEIRTON STEEL in Weirton, W. Va., new and improved facilities throughout this division increase the production and improve the quality of Weirton's tin plate, galvanized sheets and cold-rolled sheets.

For product finishers another new from Binks

New compact PUMP for airless spray painting

now spray direct from 55-gal. drums

This new Binks Model 41-8881 compact pump mounts directly into the bung of original 55-gallon containers . . . eliminates the cost of transferring material to another container before spraying.

The pump is designed for single gun airless spraying of protective and decorative coatings. All parts—which come in contact with the fluid being sprayed—are made of non-corrosive stainless steel. Parts subject to wear are of a special, hardened stainless steel.

Binks airless spraying gives you the speed and coverage of spray painting with minimum overspray—paint goes where you want it . . . on the surface . . . not into the air. Drift is greatly reduced, making this equipment ideal for use indoors or out. Result: considerable savings in both time and materials.

Bulletin A41-24 tells all . . . Ask your Binks distributor for a copy. He also can give you complete information on Binks pumps best suited to your operation. Or, write to the address below.

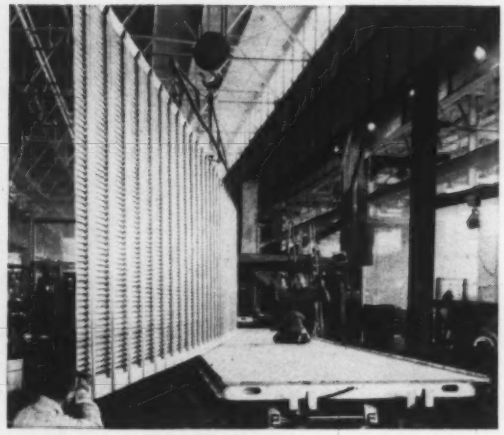
Ask about our spray painting school. Open to all . . . NO TUITION . . . covers all phases.

Binks Manufacturing Company 3148-A Carroll Avenue, Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES · SEE YOUR CLASSIFIED DIRECTORY

1339

Binks Everything for spray painting



Dollar savings provided by building Volume☆ Vans with USS Cor-Ten High Strength Steel

Fruehauf Trailer Company works some design magic with USS COR-TEN Brand Steel that results in substantial construction savings.

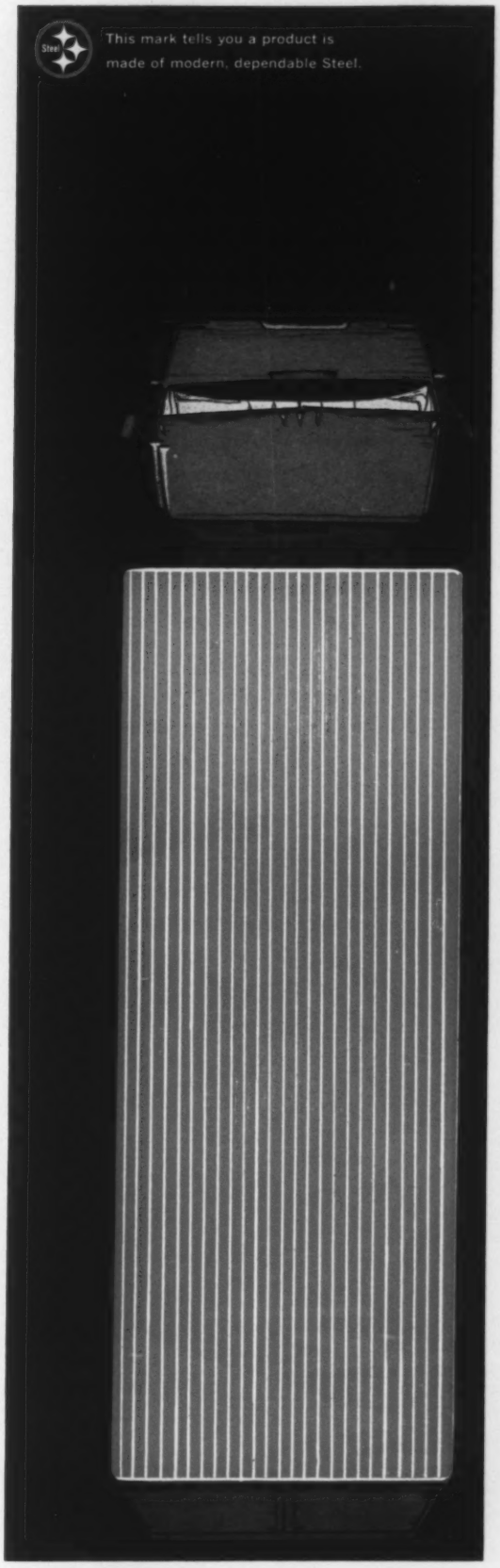
In their stressed-skin trailers, called "Hi-Tensile Volume☆ Vans," USS COR-TEN High-Strength Low-Alloy Steel is used for the side and roof panels, angles and rub rails. Welding this steel instead of riveting contributes to lower cost, also makes the Hi-Ten Volume☆ Van strong and sturdy.

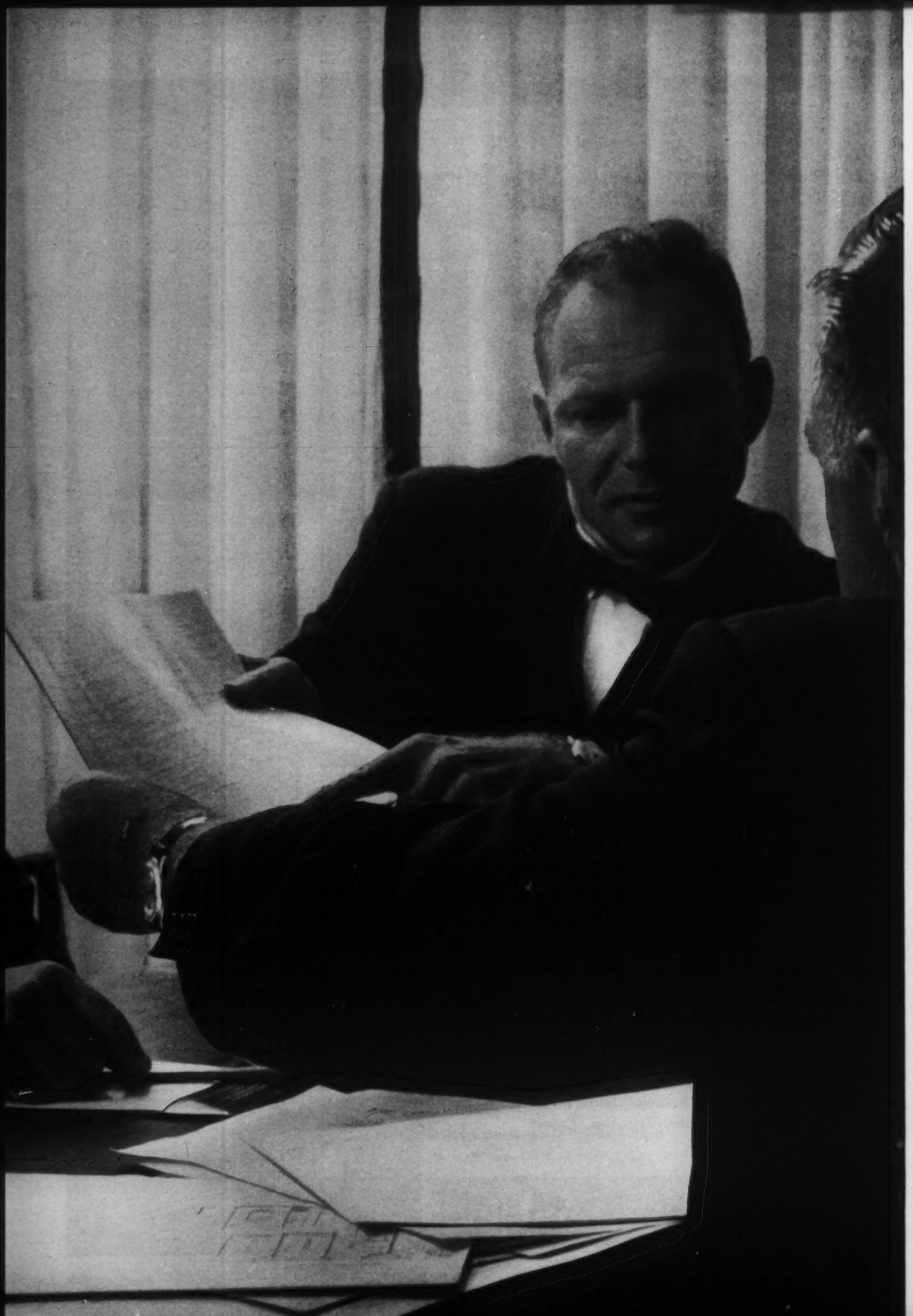
Increased strength and rigidity also are obtained by cold forming COR-TEN Steel side and roof panels with ¼" deep rectangular corrugations. Angles and rub rails are of USS COR-TEN High Strength Steel and together with the side and roof panels, add up to a total of only 2,500 pounds in each trailer. COR-TEN Steel also has improved atmospheric corrosion resistance and, as an added bonus, paint lasts much longer on COR-TEN Steel.

In transportation equipment USS COR-TEN Steel is noted for its long service life, low first cost and economical operation. Get the real facts on USS COR-TEN Steel from United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania USS and COR-TEN are registered trademarks.

United States Steel Corporation · Columbia-Geneva Steel Division · National Tube Division · Tennessee Coal and Iron Division · United States Steel Supply Division · United States Steel Export Company

USS United States Steel





"Bob, the computer analysis says we should buy those parts instead of making them"

NEW CAPITAL INVESTMENT PROGRAM

Here's a new IBM computer program that's yours for the asking. Using the Investors Method (Rate of Return on Investment), it helps you evaluate—*quickly, economically, uniformly*—alternate proposals for spending your company's money.

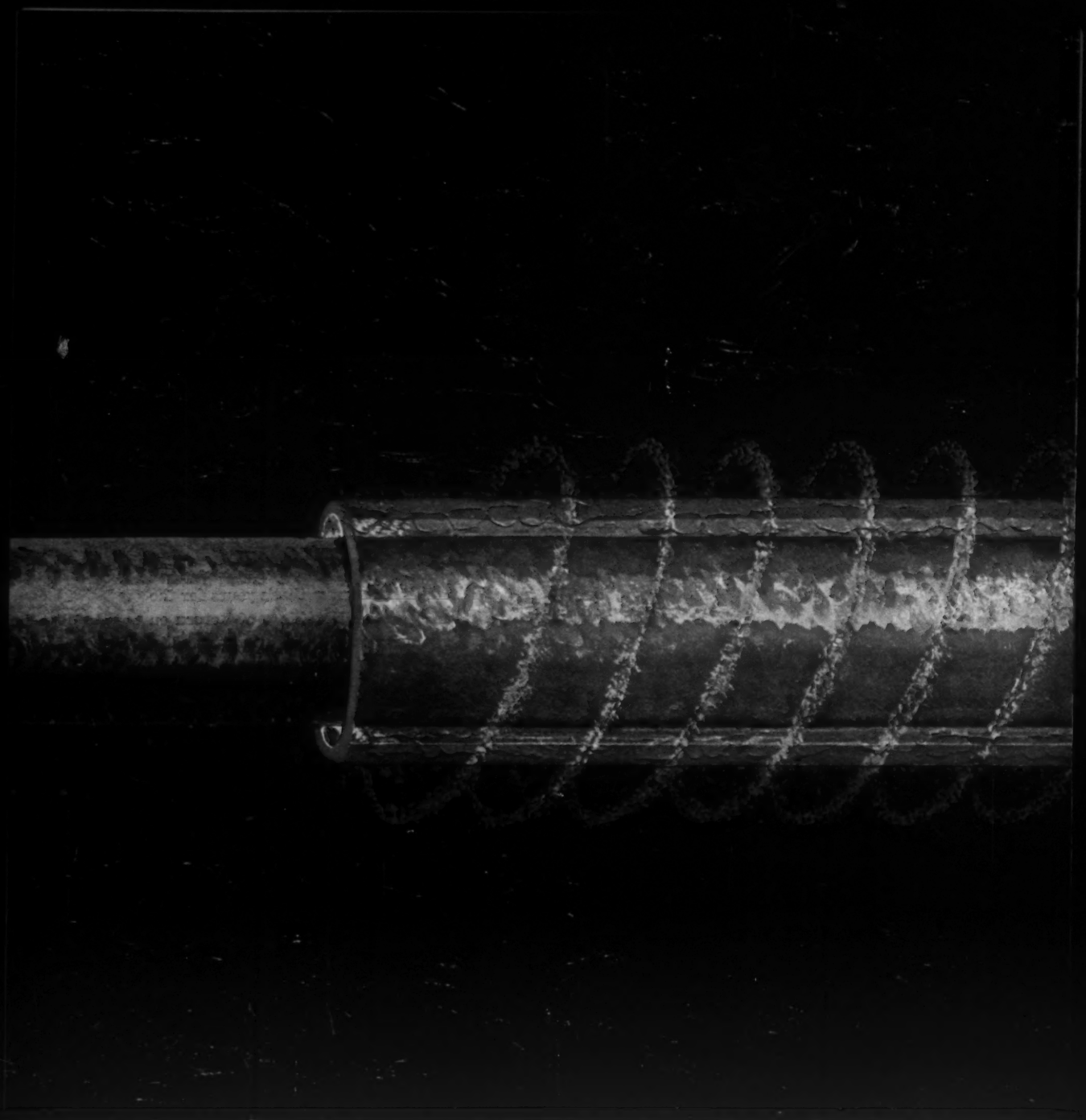
The program will help you solve problems like these: should you buy a new piece of equipment or keep the old one in repair; should you increase your manufacturing facilities; should you buy or make certain products; how should you spend your money for research to make the most profit?

These are only a few of the problems that the Capital Investment Program handles. All it takes is the Program and an IBM computer that accepts FORTRAN programming language. The low cost IBM 1620 Data Processing System is one such computer.

The new Capital Investment Program is another of the many problem solving programs IBM offers you to help make your data processing system a more effective and more profitable tool for managing your business.

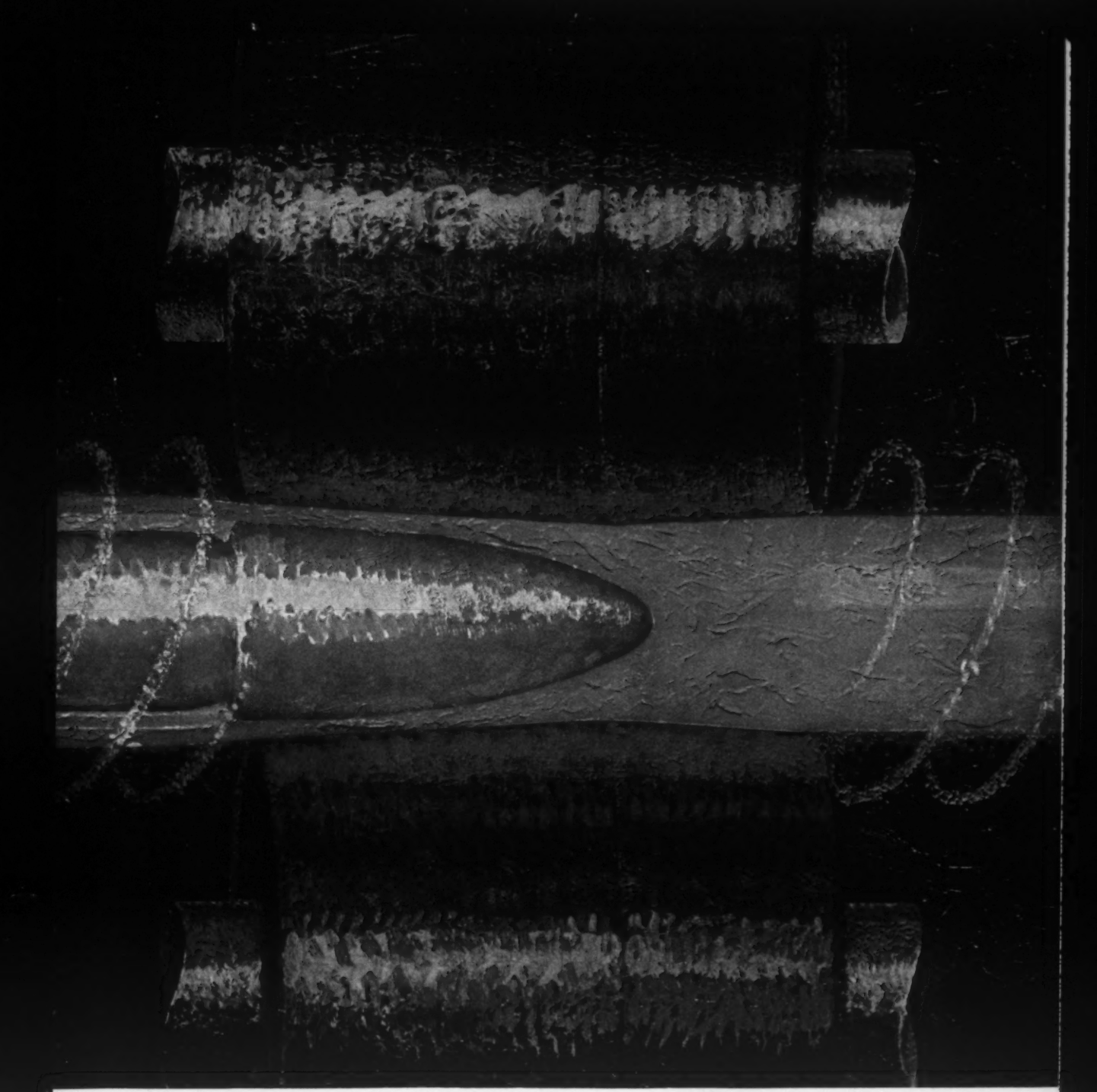
Your local IBM Representative can give you complete details on this, as well as previously announced programs, which included Sales Forecasting, Materials Planning, Inventory Management, Plant Scheduling, Work Dispatching, Operations Evaluation, Inventory Management Simulation, and many others.

IBM®
DATA PROCESSING



Remember the good old ways

This mark tells you a product is made of modern, dependable Steel.



The piercing operation is one of the first steps in creating seamless pipe or tubing from a solid section of steel. After we set the hot steel billet in place, we ram it. Spin it. Push its insides out. And stretch it into a hollow many times longer than the original piece of steel.

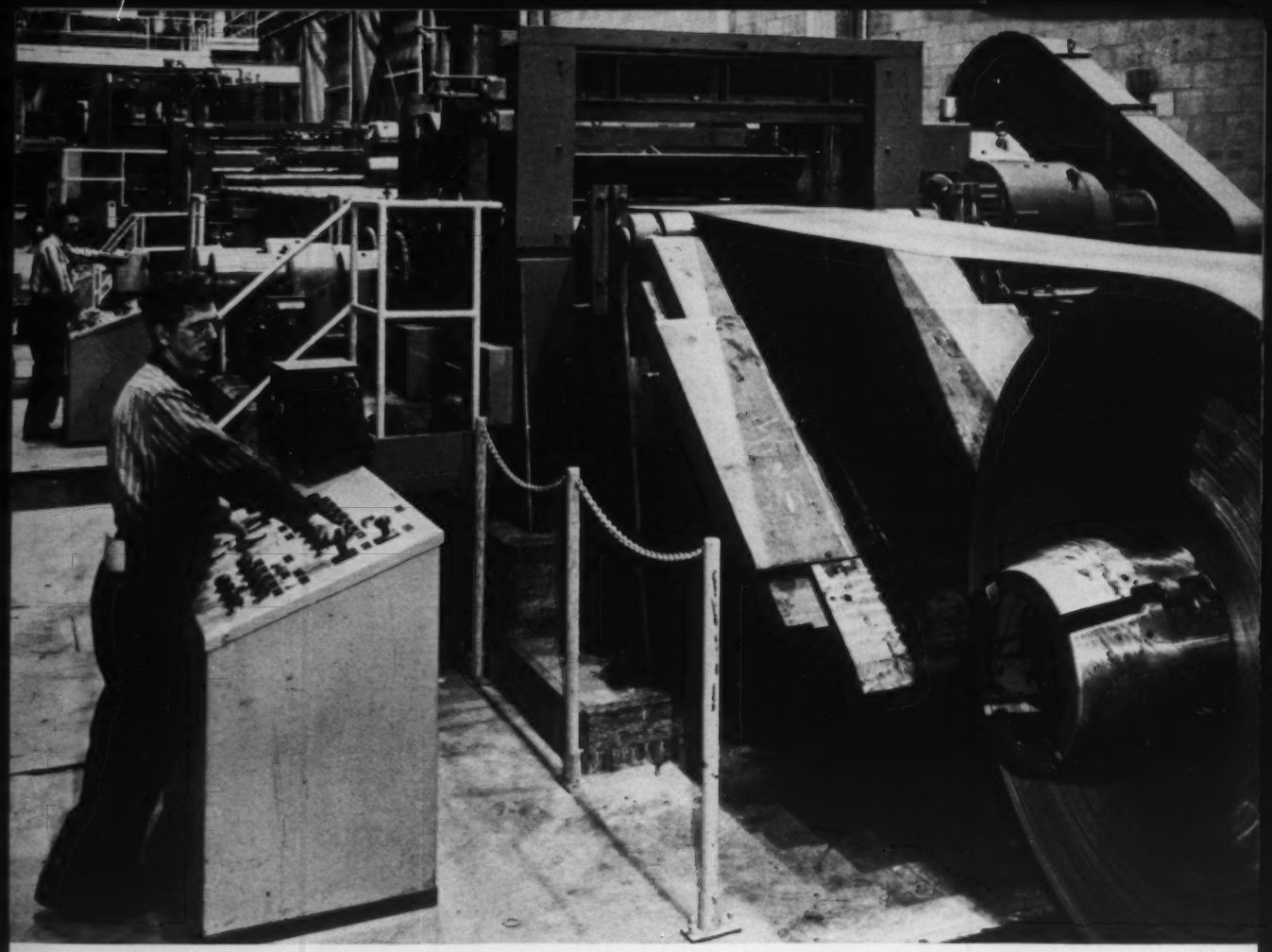
There's nothing new about making seamless tubular products this way—we've been doing it for 70 years. This doesn't mean that we're old-fashioned—but sometimes the old ways are best. Whether we use an old established method or a revolutionary new one, whatever is the best way to make pipe or tubing is how National Tube makes it.

USS is a registered trademark

National Tube Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors

United States Steel Export Company, New York



Feeding in strip at the entry reel of a galvanizing line in Hamilton, Ontario.

SINGLE RESPONSIBILITY FOR DRIVE SYSTEM DESIGN PAYS OFF FOR CANADIAN MILL

The motors, controls, regulators and sensing devices which drive this continuous galvanizing line were integrated to produce a precise performance by one totally responsible source . . . Reliance Systems Engineering.

The drive system was designed to utilize sectional generators and control, thus achieving more flexibility to handle a broader range of products. Any or all units of the line consequently can be changed to meet new production demands. Positive speed sychronization between sections is achieved with Reliance transistorized VSRR magnetic amplifier regulators.

Close control of the line is demonstrated by application of modern sensing devices. When light gauge strip is coiled, for example, a Reliance "Tensitron", senses, establishes and maintains tension at pre-set levels.

Precise tension and tracking of the strip was quickly created and preserved throughout all 32 sections of the line . . . and uniform, high quality strip was produced. Reliance willingly accepted *total responsibility* for the planning and engineering of this processing line drive at the request of the mill . . . with logical and practical results.

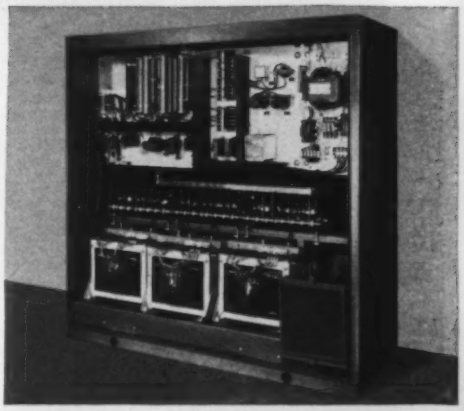
Reliance is ready and able to produce similar results for you. Your Reliance Systems Engineer can tell you even more about the advantages which can accrue to you through Reliance's Total Responsibility and Total Service. Call him —through your nearest Reliance office—or if you prefer, write us direct.

A-1687

RELIANCE...

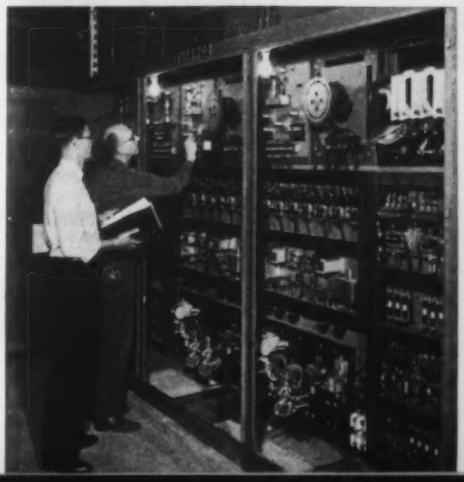
builders of the tools of automation

NEW DUTY MASTER D-5000 design brings you new standards in coolness, quietness . . . and more horsepower in less space. Frame dimensions that held 150 hp. now contain 300 hp. There is better heat dissipation from the frame itself. Air flows easily through the entire grilled end areas—exhausts through long, protected slots at the sides and bottom. New fingerless ducted rotor design means better cooling than any other previous motor. You get all famous Duty Master features in this new D-5000 . . . special lubrication design, drip or splash-proof and complete open motor protection. Bulletin B-2515.



RELIANCE V★S STATATRON is a static powered drive for wide range variable speed from in-plant a-c. circuits, available from 1 to 200 hp. Instead of a motor-generator set, the Statatron uses silicon diodes and saturable reactors to rectify the current from a-c. to d-c. These work in combination with a transistorized power exciter to supply variable voltage. Statatron is compact—35% smaller than conventional units. Consists of only three components: Super 'T' d-c. motor, operator's station and control cabinet. Statatron is quiet—vibrationless and low in maintenance cost. Bulletin D-2508.

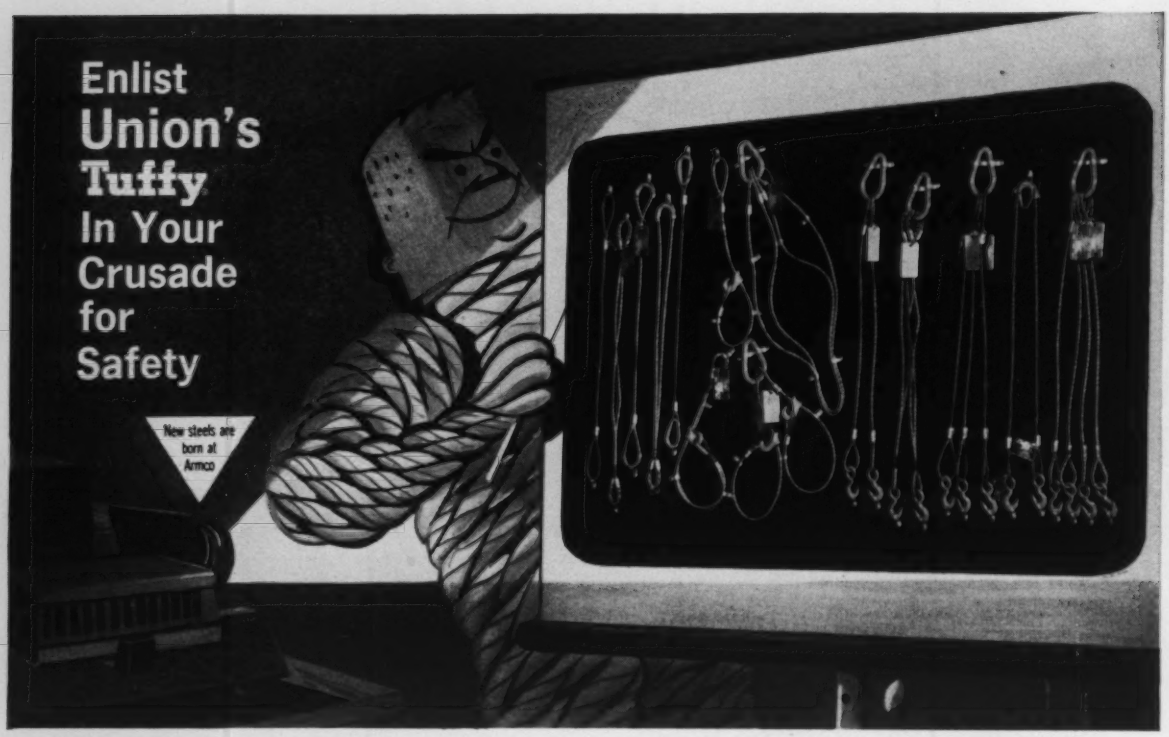
THIS MASTER GEARMOTOR drives a chip conveyor on automatic screw machine. The combination parallel and right angle reduction produces efficient low output speed at high torque—ideally suited to this operation. Features important here are its compactness and one piece construction, saving space and maintenance. This Master Gearmotor is impervious to liquids . . . splashing of coolant and any other outside contamination. Where the situation calls for gearmotors, this full line can cut your engineering and assembly costs . . . give you dependable performance. Bulletin E-2409.



TOTAL SERVICE is an integral part of every Reliance product, from engineering and start-up assistance to maintenance and renewal parts. The photo shown here is typical of a Reliance Service Engineer's on-the-job availability—for maintenance and consultation on knotty problems. Every Reliance Sales Engineering Office and Distribution Center—nationwide—gives you the attention and experience necessary to assure the top performance you expect from the Reliance equipment you buy.

RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 4-11, CLEVELAND 17, OHIO • Canadian Division: Toronto, Ont.



"Accidents on the job cost industry more than $4 billion a year," reports the National Safety Council. 230 million man-days were lost, nearly 2 million disabling injuries were suffered in 1959. As rough as these figures look, they represent progress. The accident rate has been cut in half since the twentieth century started.

In plant after plant demonstrations by Union fieldmen have pointed the way to accident reductions. They show how the correct use of the right set-up of Union's Tuffy Slings and Hoist Lines affords greater safety and longer service life.

Proper Fittings Add Safety, Too

Union provides a sling fitting for every need. Fully described in the Tuffy Sling Handbook. Have them factory-fitted when you order slings or rig them yourself. Enroll in Union Tuffy's safety-lift club. Start by sending for the two books offered below.

Union Wire Rope Tuffy Tips on safe use of Slings and Hoists

Lifting Strains Take High Toll of Injuries

Did you know that in some states one in every six compensation claims involves back injuries? And that one insurance company says back injuries constitute 60% of their claim expense? Hernia is another hazard of materials handling. One manufacturer reported 75% of his compensation claims involved hernias. This high incidence of hernias and back injuries can be greatly reduced by proper lifting equipment and methods.

Free! Two Valuable Tuffy Handbooks

1. "Tuffy Tips" include many more safety hints. Also tells how to use wire rope and slings to get longer service life. Tuffy Tips do's and don't's can mean money in your pocket.

2. "Tuffy Sling Handbook." Tells all about slings from A to Z. Contains helpful data on the selection and use of slings—types, dimensions, weights, fittings, rated loads, safety-approved signals.

6-61

BOTH FREE! Write Union Wire Rope, Armco Steel Corporation, 2160 Manchester Ave., Kansas City 26, Missouri

ARMCO Union Wire Rope

THERE IS A SERVICE-PROVED

UNITED® ROLL

FOR EVERY ROLLING APPLICATION

1901 UNITED 1961

Progress... Leadership United for Sixty Years

United Rolls . . . Ask any steelman and he'll tell you those words are almost as common to him as gauge and reduction. You'll get a similar response from the men who roll paper and rubber.

Service-proved United rolls have been on the job for more than 50 years—longer than the age of many of the men who rely upon them today for precise trouble-free rolling.

Behind each United roll application stands United's service engineers, metallurgists and roll makers. They have a wealth of experience, knowledge and skill. That's why United rolls set the quality standards for the industry.

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Co., Inc., Aurora, Indiana.

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

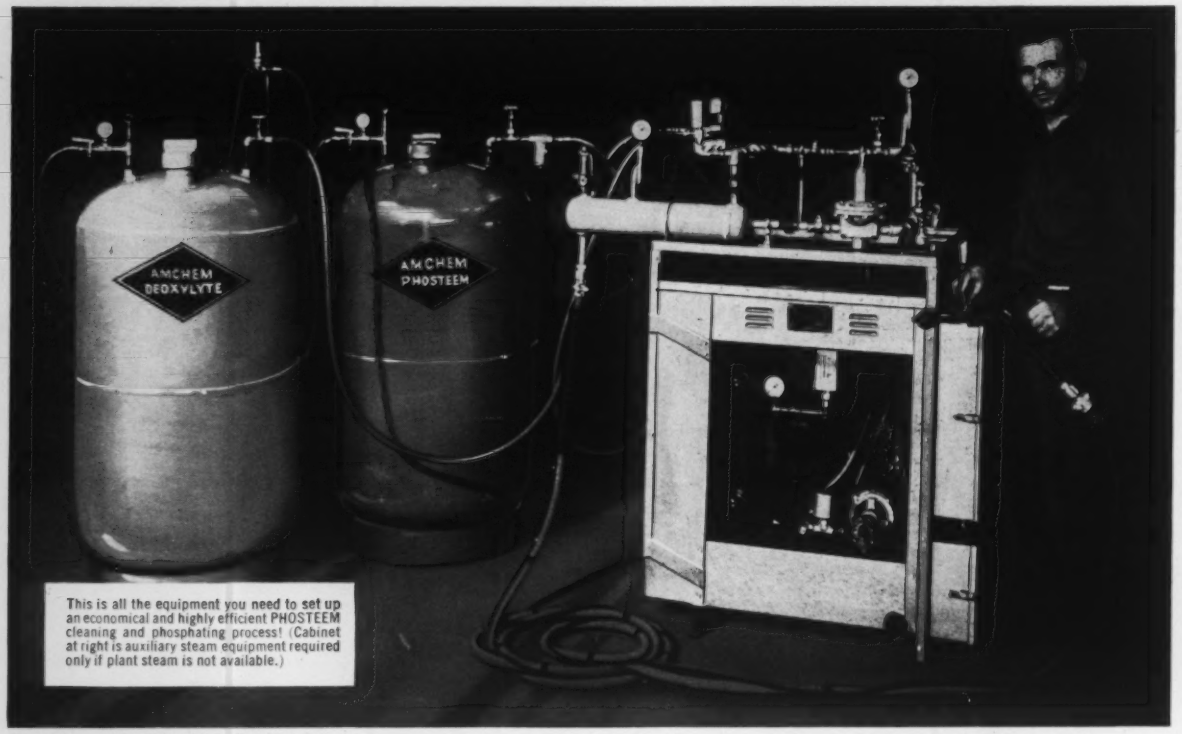
UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH 22, PENNSYLVANIA

Put a complete cleaning-phosphating department in your plant at a fraction of the cost and space of standard systems!

AMCHEM **PHOSTEEM***



This is all the equipment you need to set up an economical and highly efficient PHOSTEEM cleaning and phosphating process! (Cabinet at right is auxiliary steam equipment required only if plant steam is not available.)

Photo courtesy of the Electro Steam Generator Co.

QUALITY COATING—
the PHOSTEEM process cleans and phosphatizes metal surfaces simultaneously, even provides a final acidulated rinse, closely duplicating the quality obtained with conventional power spray washers. It increases corrosion resistance, adds paint bonding durability to any size or shape of virtually any metal alloy product . . . with coating uniformity far superior to hand and conventional steam cleaning.

MINIMUM REQUIREMENTS—
you can install a PHOSTEEM system with a surprisingly small investment. You can utilize existing plant steam or install an inexpensive steam generator.

DOWN-THE-LINE ECONOMY—
PHOSTEEM requires a minimum of floor space. Costly controls are completely eliminated. Yet you can use PHOSTEEM anywhere, anytime, for any kind of metal surface preparation!

If your production cycle is low or sporadic PHOSTEEM can be a wise investment to insure superior metal treating quality at a cost consistent with your production schedules. Call in your local Amchem Representative for the facts and figures, or write us direct for complete systems data.

*PHOSTEEM is a registered trademark of Amchem Products, Inc. for its cleaning and coating chemical.

AMCHEM **PHOSTEEM**

Amchem is a registered trademark of **AMCHEM PRODUCTS, INC.**
(Formerly American Chemical Paint Co.)
AMBLER, PA. • Niles, Calif. • Detroit, Mich. •
St. Joseph, Mo. • Windsor, Ont.

THIS CINCINNATI®
shears heavy plate

Paragon Bridge & Steel Co., Novi, Mich., cuts costs as it cuts heavy plate with this Cincinnati Shear:

Operators cut production time with rapid, easy gaging and adjustment; no need for changing knife clearance to cut different thicknesses of metal.

The Cincinnati Shear also permits square shearing, notching, and slitting operations.

This machine can trim an edge to one-half the thickness of a sheet or plate. Furthermore, longer knife life is obtained from extra-size, four-edge knives.

Whether you're considering a mechanical or hydraulic shear, the broad Cincinnati line offers you maximum advantages for your plate shearing requirements. Write for your copy of a Cincinnati Shear catalog.

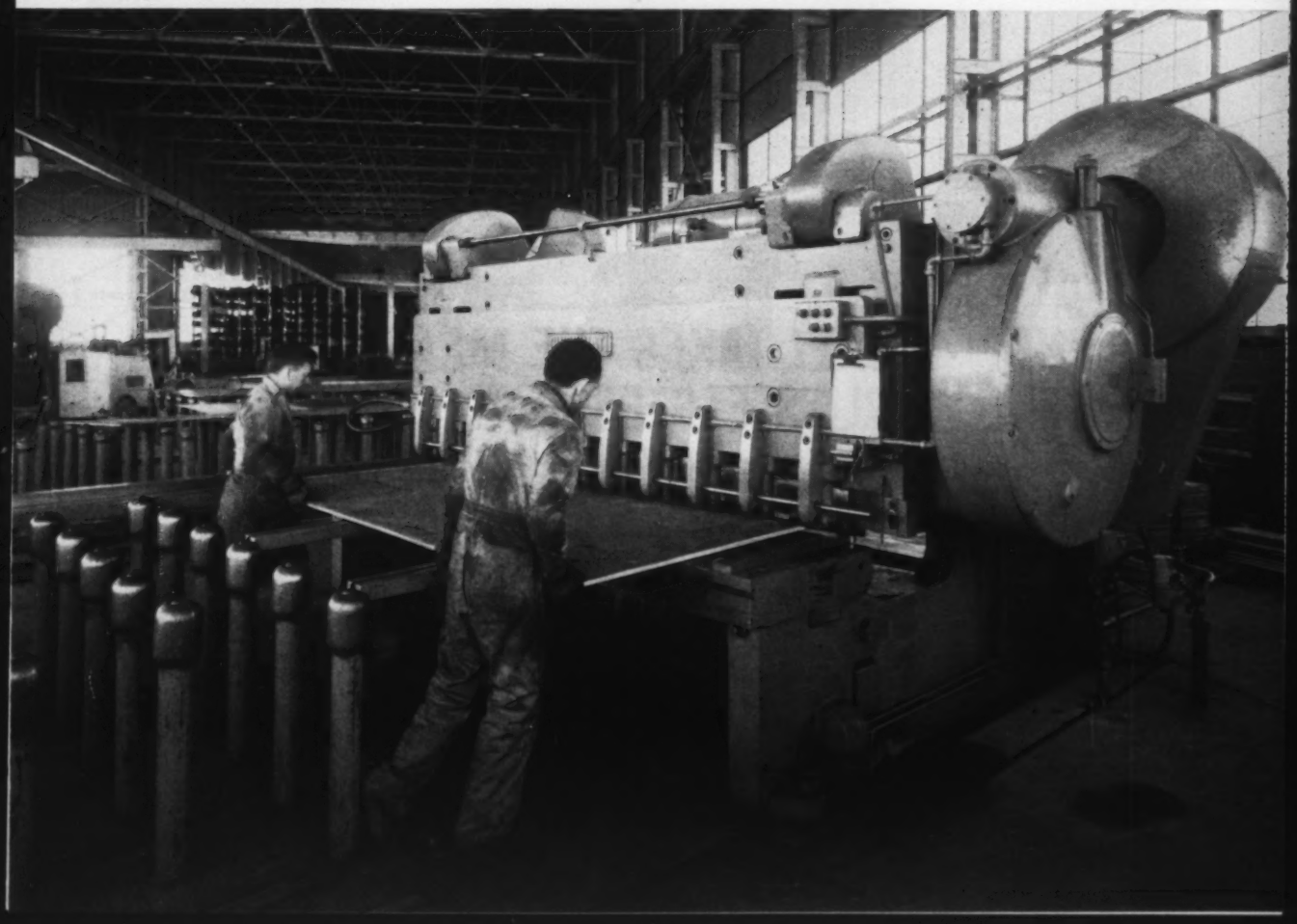
Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio, U.S.A.

United Kingdom: The Cincinnati Shaper Co., Ltd., Glasgow, Scotland

Courtesy Paragon Bridge & Steel Co., Novi, Mich.



DEPARTMENT OF DEFENSE—AIR FORCE PHOTO

HOW NICKEL TAKES THE MEASURE OF THE WORLD'S FASTEST ROCKET TRACK

This is a 2000-miles-an-hour-plus rocket sled hitting the water brakes ... part of continuing tests by the Air Force Systems Command.

The sled travels on a 35,050-foot track that was built with such precision that even the curvature of the earth was considered in its construction.

Rocket, aircraft, and missile components roaring down this track at Holloman Air Force Base, New Mexico, are timed and photographed right at rail level. How? By blades—set at intervals of exactly 13.00 feet along the track—that interrupt a light beam as the sled rockets by.

To align these vital track blades, a tape made of Invar (36% Nickel) was specified. This nickel-iron alloy has an extremely low coefficient of linear expansion ... virtually eliminates error caused by variations in ambient temperature conditions.

Consequently, there isn't .005-of-an-inch deviation in blade alignment in the *entire* seven miles of track.

When it's important to you that alloys resist all sorts of temperature conditions ... or great stress and impact ... or high corrosion ... look to the alloys that contain Nickel. They might well solve your metals problems—accurately—and at practical cost. Why not write to us describing your metal needs.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street INCO New York 5, N. Y.

INCO NICKEL

MAKES ALLOYS PERFORM BETTER LONGER

Metalworking—1962

Over the years, we have developed substantial skepticism about economic prognostications. The most statistically correct projections often go awry, probably because people refuse to act like statistics.

But we have a certain paternal favoritism for the look ahead in this issue (Page 67). The editors asked 5000 general managers of metalworking plants to give us their expectations for 1962 at their establishments.

Nearly four in five believe that their sales volume will be higher than this year's.

That is the largest percentage of metalworking managers to predict an upturn in any year since this series of surveys was started in 1946. We believe that the weight of the result indicates that the economy is headed in the right direction.

The volume of increase predicted—7 per cent—is lower than it has been in some previous years. Such an upturn—after four years of rather disappointing business—is relatively modest. The basic steel industry, the machine tool builders, the metal fabricators, or almost any other category of metalworking could tuck away a 7 per cent increase in volume and still have a lot of unused capacity.

On the basis of what metalworking managers tell us, 1962 will be a year of intense competition. It will be a year in which some companies will make better profits than the average for the last several years. Other companies will go to the wall.

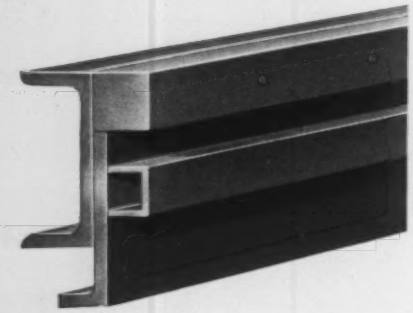
Metalworking will face some tough problems: Price fighting, more rugged foreign competition, union demands for payments that outrun productivity increases, and a continuation of restrictive work practices. The industry will probably operate without adequate depreciation allowances and may run into some harassment from an administration that has given only lip service aid to date.

Business will be better, but it will be a year to challenge all the skills of the industry's managers—in design, in manufacturing efficiency, in taking advantage of the new technological advances, in marketing, and in the deployment and utilization of people.

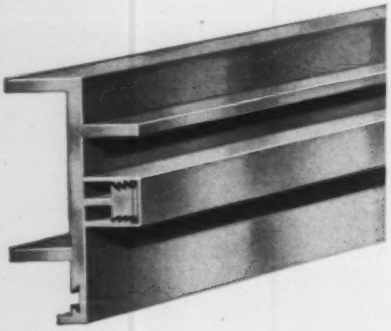
Walter J. Campbell

EDITOR

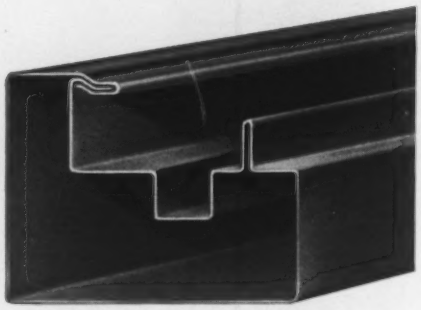
Have your components



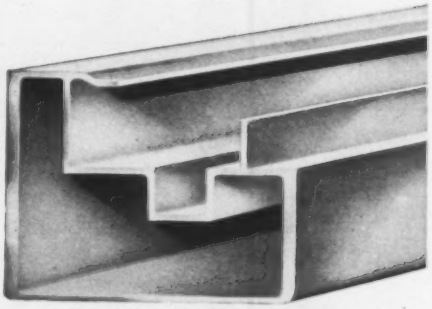
BEFORE: four standard shapes assembled to form a complex unit.



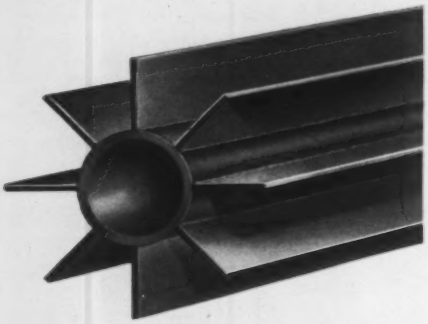
AFTER: two extruded shapes snap into place, saving time, eliminating fasteners.



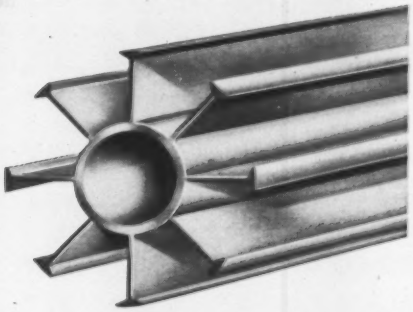
BEFORE: a roll-formed steel sheet.



AFTER: a stiffer, stronger aluminum extrusion with closer dimensional accuracy . . . design flexibility . . . and lower costs.

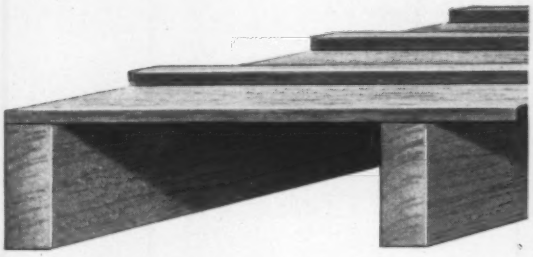


BEFORE: a labor-consuming soldered copper assembly.

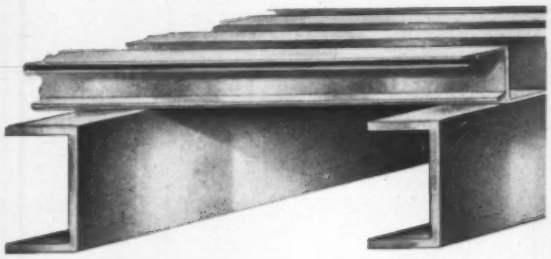


AFTER: a finished aluminum extrusion that is far less costly, lighter, stronger, and produced to closer tolerances.

had their yearly checkup?



BEFORE: friction rails . . . deck . . . cross-beams . . . all of wood.



AFTER: extrusions of light, low-cost, rot-proof, splinterproof aluminum do the job. Hollow rails make cooling or heating easy.

More and more companies have consulted extrusion specialists . . . and switched from rolled, crimped, welded, machined or assembled parts to cost-cutting aluminum extrusions.

Have an independent extruder analyze your product line right away—and regularly from now on. The chances are excellent that he can help make major cost savings.

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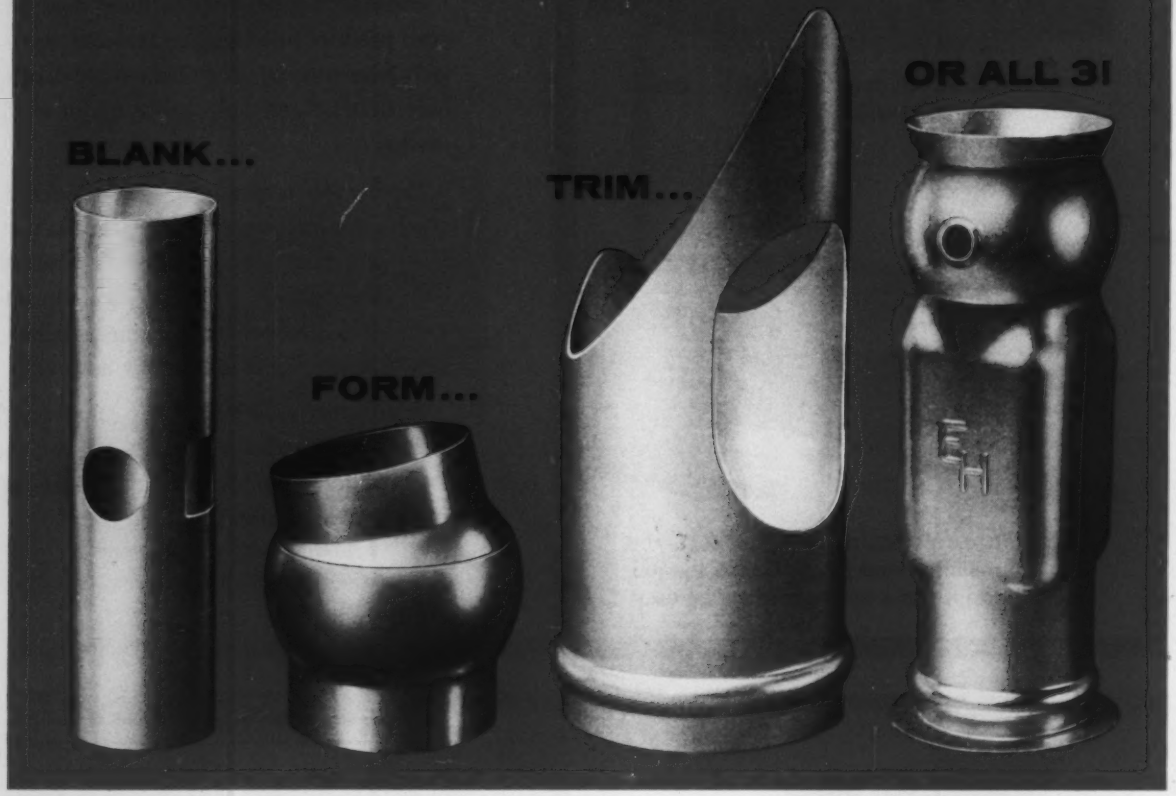

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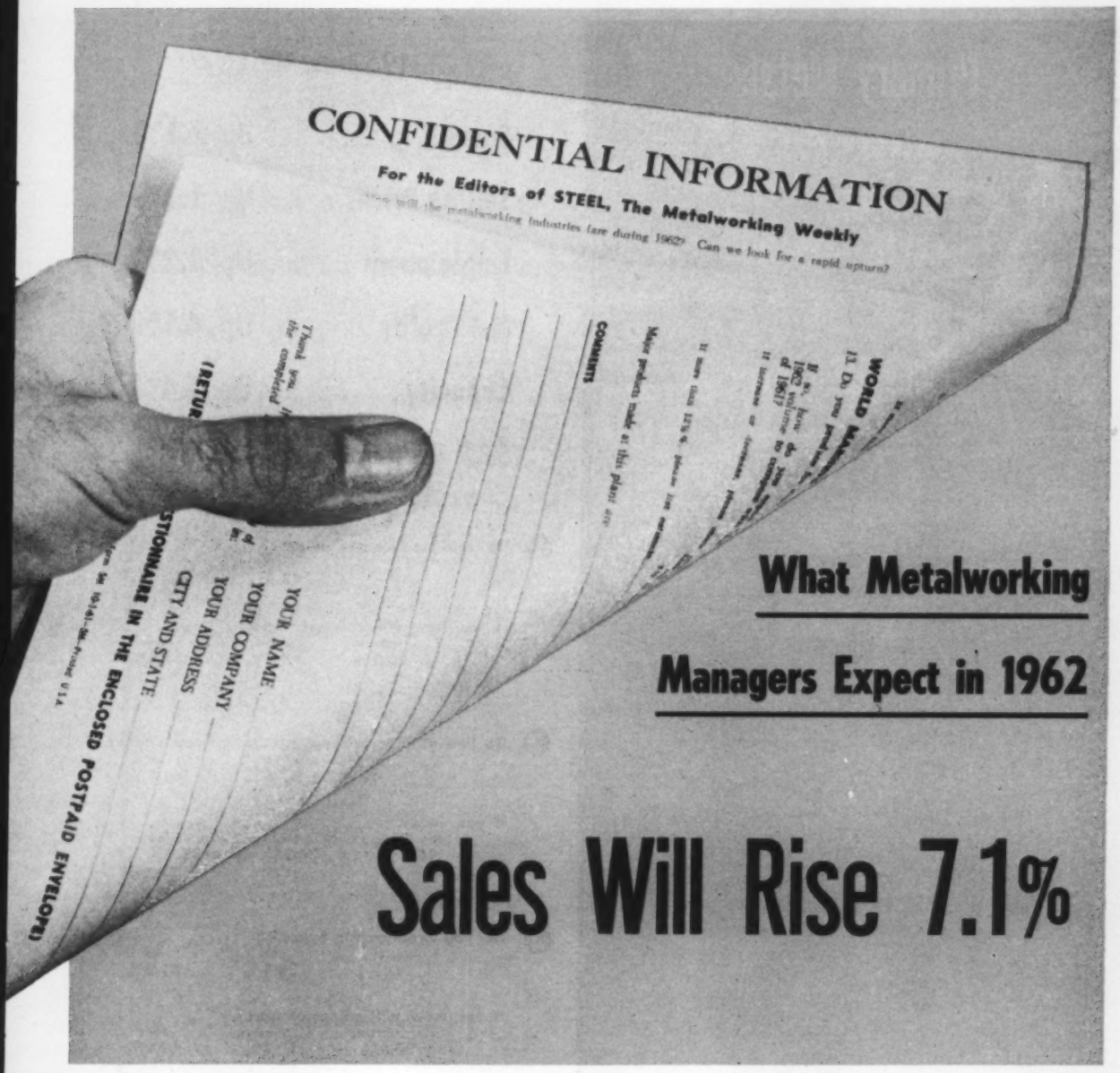
GENERAL DYNAMICS | ADVANCED PRODUCTS DEPARTMENT GD



77.5% expect a sales increase

15.9% expect no change

6.6% expect a decrease

NEVER BEFORE have so many respondents to STEEL's annual survey of What Metalworking Managers Expect expressed optimism for sales in an upcoming year.

The editors think that the results are significant because the managers have been right in all but one of our surveys—they missed in 1957, as did a lot of other prognosticators.

Their predictions are on the following pages.

What metalworking managers expect in 1962 vs. 1961

Primary Metals

S. I. C. 33

1962 vs. 1961

Sales	**Up 7.1%**
Selling Prices	**Up 1.3%**
Employment	**Up 3.2%**
Net Profits	**Up 4.1%**
Capacity	**Up 2.4%**
R&D Spending	**Up 2.1%**

1 **Do you produce for defense?**

Yes	No
43.6%	56.4%

If yes, how will sales compare?

Increase	Decrease	Same
56.5%	8.1%	35.4%

2 **Do you plan to increase production capacity?**

Yes	No
37.6%	62.4%

If yes, how?

New Plants	Plant Additions	New Equipment
10.8%	26.2%	88.4%

3 **Do you produce for export?**

Yes	No
38.1%	61.9%

If yes, how will sales compare?

Increase	Decrease	Same
37.4%	12.7%	49.9%

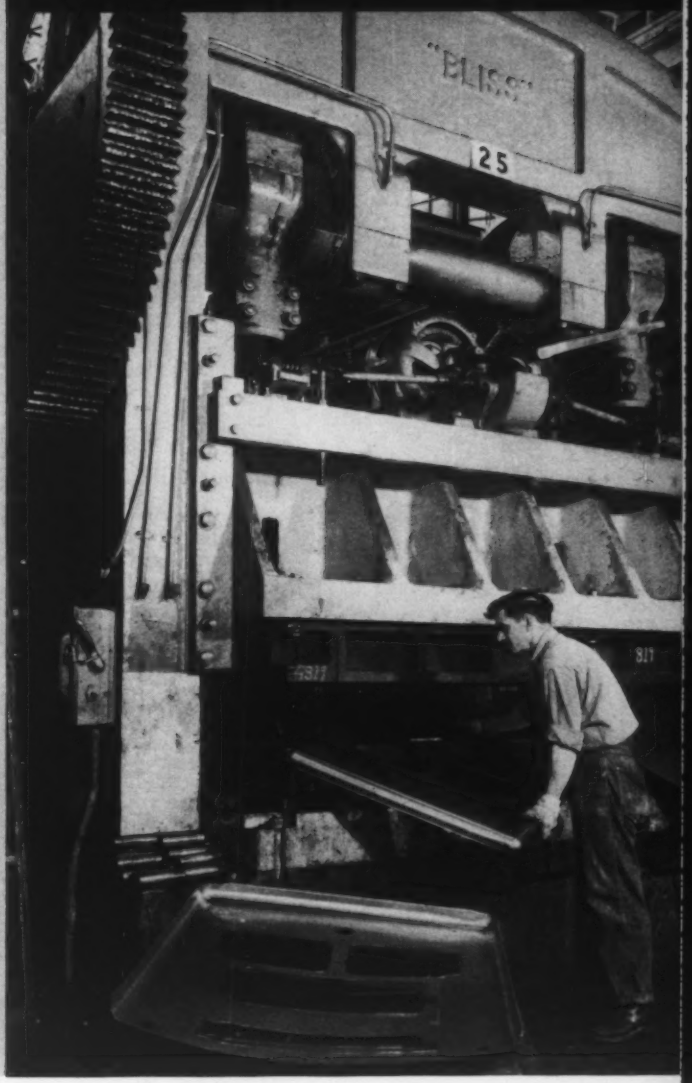
METALWORKING SALES will hit a record $162 billion in 1962—about 7 per cent above this year's expected $152 billion.

That's the consensus of respondents to STEEL's survey of 5000 metalworking managers. While more managers voiced optimism than in any other previous survey, they also cited some basic problems. Here are the highlights of their composite forecast:

- Unit manufacturing costs (labor, materials, overhead) will rise 3.2 per cent.
- Marketing costs will stay about where they are now.
- Selling prices will be boosted slightly—the expected gain averages out to 1.7 per cent.
- Employment will climb about 3 per cent.
- Profits will go up an average of 6 per cent.
- Manufacturing capacity will be increased 2.8 per cent.
- More than 60 per cent of the metalworking firms plan to introduce new products in 1962.
- Research and development expenditures will inch up.

Fabricated Metal Products

S. I. C. 34



1962 vs. 1961

Sales	Up 5.7%
Selling Prices	Up 1.7%
Employment	Up 2.7%
Net Profits	Up 5.9%
Capacity	Up 2.7%
R&D Spending	Up 1.4%

1 Do you produce for defense?

Yes	No
37.8%	62.2%

If yes, how will sales compare?

Increase	Decrease	Same
58.3%	4.2%	37.5%

2 Do you plan to increase production capacity?

Yes	No
37.2%	62.8%

If yes, how?

New Plants	Plant Additions	New Equipment
12.9%	21.7%	80.0%

3 Do you produce for export?

Yes	No
43.6%	56.4%

If yes, how will sales compare?

Increase	Decrease	Same
36.2%	8.6%	55.2%

• Price fighting and union demands will continue to be the industry's biggest headaches.

• **Sales Breakdown**—The most optimistic executives are in the electrical machinery industry (S.I.C. 36): 90 per cent predict that their sales will improve next year. Only 2.8 per cent foresee a drop. Their overall projected increase is 10.1 per cent, which would give the industry sales of nearly $27 billion in 1962.

Managers of primary metals companies look for a 7 per cent plus gain in sales. Their estimated volume will hit $27 billion. The men who manage plants that fabricate metal products expect a 5.7 per cent increase, to $22 billion; the machinery (except electrical) group believes that sales will show a 6.7 per cent improvement, reaching about $38 billion; sales volume in the transportation industry is tabbed for a 10 per cent gain. The projected total is $43 billion; and instrument makers think a 7.8 per cent increase will boost their sales to $5.9 billion. (Individual sales

What metalworking managers expect in 1962 vs. 1961

1962 vs. 1961

Sales	Up 6.7%
Selling Prices	Up 2.1%
Employment	Up 2.8%
Net Profits	Up 6.4%
Capacity	Up 2.2%
R&D Spending	Up 1.4%

1 Do you produce for defense?

Yes	No
38.4%	61.6%

If yes, how will sales compare?

Increase	Decrease	Same
59.8%	4.8%	35.4%

2 Do you plan to increase production capacity?

Yes	No
32.3%	67.7%

If yes, how?

New Plants	Plant Additions	New Equipment
9.3%	32.4%	67.4%

3 Do you produce for export?

Yes	No
75.6%	24.4%

If yes, how will sales compare?

Increase	Decrease	Same
44.0%	9.5%	46.5%

figures do not add up to total sales because of rounding and allowances for sampling error.)

• **Exports, Defense Work**—More metalworkers are looking overseas for markets. Of the companies responding to the survey, 56.8 per cent are producing for export vs. 41.2 per cent a year ago. Of the firms exporting products, 41.3 per cent predict a sales increase; 8.1 per cent anticipate a decrease. Only the primary metals industry expects an over-all decrease in export sales. Producers of electrical machinery are the most optimistic. They're looking for a 2.9 per cent increase.

Nearly 40 per cent of the plants queried are doing defense work vs. about 33 per cent in 1959 and 1960. The change reflects boosts in government spending. In comparison, 85 per cent of the companies were producing for defense during the Korean War.

Of the firms producing for defense now, 59.6 per cent look for military sales to rise an average of 4.7

1962 vs. 1961

Sales . . . . . Up 10.1%

Selling Prices . . . Up 1.2%

Employment . . . . Up 5.3%

Net Profits . . . . . Up 7.2%

Capacity . . . . . Up 7.5%

R&D Spending . . . Up 3.3%

1 Do you produce for defense?

Yes	No
47.7%	52.3%

If yes, how will sales compare?

Increase	Decrease	Same
71.6%	1.3%	27.0%

2 Do you plan to increase production capacity?

Yes	No
50.0%	50.0%

If yes, how?

New Plants	Plant Additions	New Equipment
20.3%	28.9%	62.1%

3 Do you produce for export?

Yes	No
57.3%	42.7%

If yes, how will sales compare?

Increase	Decrease	Same
46.6%	1.3%	52.1%

per cent in 1962. The greatest improvement (12.4 per cent) is expected by instrument producers.

• **Costs, Prices**—About 84 per cent of the managers report that their unit manufacturing costs (labor, materials, overhead) will go up in 1962. The average increase is 3.2 per cent. Only 5 per cent of the executives forecast a decline. Nearly 80 per cent of the plants face an automatic wage increase or labor negotiations next year.

While better than 8 out of 10 plants are looking for their costs to rise next year, less than half (47.8 per cent) say their selling prices will be higher—and in every case only small upward revisions are contemplated. The reasons are all too familiar: Price fighting and foreign competition.

Price fighting is still the chief troublemaker for metalworkers. We asked them: "What will be your biggest single problem in 1962?" Here's how responding company executives voted:

What metalworking managers expect in 1962 vs. 1961

Transportation Equipment

S. I. C. 37

1962 vs. 1961

Sales	Up 9.9%
Selling Prices	Up 0.8%
Employment	Up 4.0%
Net Profits	Up 4.5%
Capacity	Up 2.8%
R&D Spending	Up 2.6%

1 Do you produce for defense?

Yes	No
50.8%	49.2%

If yes, how will sales compare?

Increase	Decrease	Same
53.8%	7.3%	38.8%

2 Do you plan to increase production capacity?

Yes	No
36.3%	63.7%

If yes, how?

New Plants	Plant Additions	New Equipment
34.5%	37.8%	41.7%

3 Do you produce for export?

Yes	No
39.9%	60.1%

If yes, how will sales compare?

Increase	Decrease	Same
44.4%	8.7%	46.9%

Price fighting	66.3 per cent
Union demands	11.7 per cent
Inadequate depreciation	7.4 per cent
Foreign competition	3.5 per cent

These comments are representative:

"Foreign competition forces the domestic firm to reduce prices; this in turn creates price fighting."—a stamper on the West Coast.

"Price cutting is a bigger problem than foreign competition."—a large metalworker in Indiana.

"Our industry has far too much capacity. Only new products and new markets can halt the price cutting."—plant manager for an investment casting company in Pennsylvania.

"Cost control is our greatest problem. A revision of depreciation rates would be the greatest single help the government could give industry."—a stamper in Milwaukee.

"Unions have not yet assumed a responsible attitude with respect to the cost-price squeeze. The

1962 vs. 1961

Sales	Up 7.8%
Selling Prices	Up 1.9%
Employment	Up 2.6%
Net Profits	Up 4.7%
Capacity	Up 2.5%
R&D Spending	Up 2.5%

1 Do you produce for defense?

Yes	No
31.1%	68.9%

If yes, how will sales compare?

Increase	Decrease	Same
49.9%	——	50.1%

2 Do you plan to increase production capacity?

Yes	No
41.2%	58.8%

If yes, how?

New Plants	Plant Additions	New Equipment
15.3%	14.3%	84.7%

3 Do you produce for export?

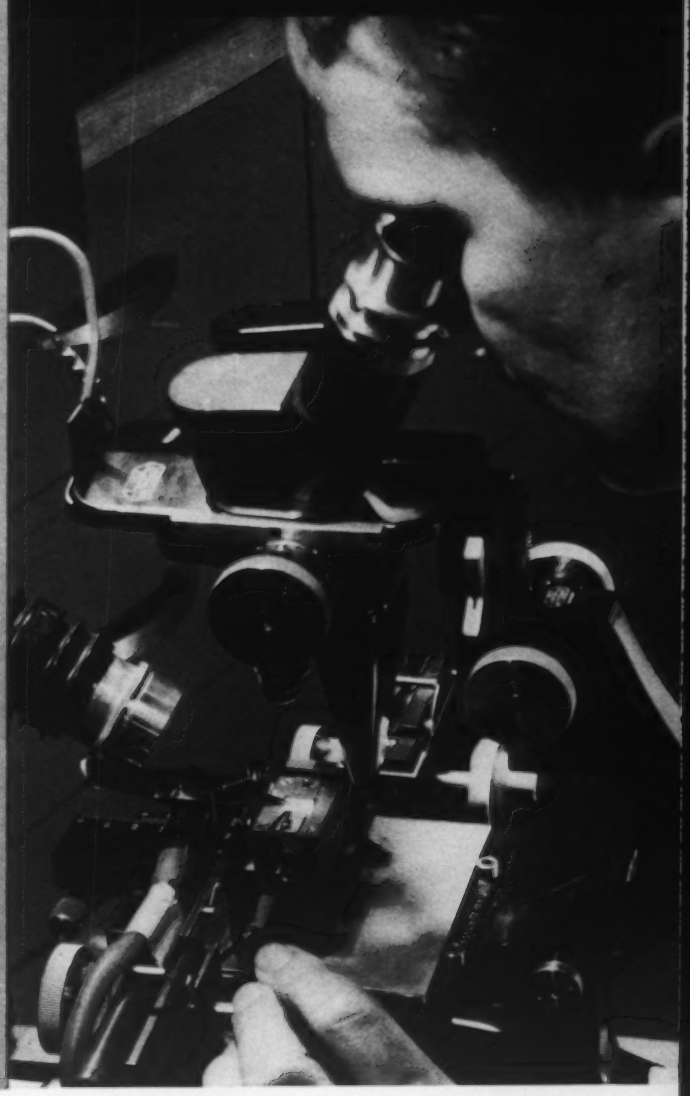
Yes	No
82.4%	17.6%

If yes, how will sales compare?

Increase	Decrease	Same
43.4%	7.2%	49.4%

Instruments, Related Products

S. I. C. 38



federal government is naive and unkind in its attitude toward business."—a fabricator in Omaha, Nebr.

Foreign competition is a problem (in varying degrees) in about 40 per cent of metalworking (see tables, Page 74). Its impact is greatest among fabricators of metal products and makers of instruments.

Close to 12 per cent of the managers in the fabricated metal products industry term foreign competition as "critical"; 15.2 per cent say it is "severe"; and 44.5 per cent regard it as "difficult."

• **Fighting Back**—Despite the problems, aggressive metalworkers are battling costs and spending money to improve their productivity and (ultimately) their profits.

Thirty-seven per cent of the respondents say their companies plan to increase capacity vs. 36.5 per cent last year. The over-all gain in capacity will come to about 2.8 per cent. Metalworkers whose products go into construction or metalworking equipment will be wise to comb their prospect lists in the electrical ma-

Where Foreign Competition Hurts

Question: Is foreign competition a problem for your plant?

Yes—39.5% No—60.5%

Question: If you answered yes, how would you describe the competition?

Critical . . . . . 5.6% Difficult 36.6%

Severe . . . . . 15.3% Mild 42.5%

Plant Size Breakdown	Critical	Severe	Difficult	Mild
Less than 100 employees	7.8%	15.5%	34.9%	41.7%
100 to 499	3.6%	17.1%	36.0%	43.2%
500 or more	5.6%	13.6%	38.4%	42.4%
Industry Group Breakdown				
Primary Metals	0.2%	2.7%	35.4%	35.4%
Fabricated Metal Products	11.9%	15.2%	44.5%	28.2%
Machinery (except electrical) . . .	3.7%	12.5%	33.8%	50.0%
Electrical Machinery	3.2%	6.5%	32.2%	58.0%
Transportation	——	20.0%	20.0%	60.0%
Instruments, Related Products . . .	11.1%	——	33.3%	55.5%

chinery field. Half of all plants plan to boost capacity via new plants, plant additions, or new equipment.

About 32 per cent of the executives report that their plants will spend more on research and development than they did this year. The biggest increases are scheduled by instrument producers (49.8 per cent say they plan to spend more) and the electrical machinery firms (39.4 per cent plan increases).

Most of the R&D budget expansions are being planned by large companies. Of those employing 500 or more, 38.4 per cent expect to hike R&D efforts next year; of firms with 100 to 499 workers, 34.6 per cent plan increases; and only 25.5 per cent of the plants with less than 100 workers will allocate more money for R&D than they did in 1961.

Most of the new products introduced in 1962 will be the creations of large firms. Among plants with 500 or more employees, 72.5 per cent plan new product introductions vs. 62.5 per cent for the 100 to 499 worker plants and 50.1 per cent of the less than 100 employee firms.

Here's how metalworking industries will compare in terms of new product introductions: First, instrument makers (81.9 per cent) will bring out new products; second, electrical machinery producers (69.7 per cent); third, machinery, except electrical (66.3 per cent).

• **Payoff**—Profitwise, the managers are optimistic—although not to the same degree as they are about sales. Over-all, 60.1 per cent of the managers say their profits will rise—the statistical average comes out to about 5.9 per cent. About 16.8 per cent expect profits to slide.

By industries, instrument makers are the most hopeful about profits—67.7 per cent predict an increase; 9.2 per cent foresee a decrease. The transportation industry is the least optimistic: 52.4 per cent forecast an increase; 25.2 per cent expect a decrease.

• **Wrapup**—Over-all, metalworking's outlook for 1962 is bright. A record year in sales and profits is probable.

An extra copy of this survey is available upon request. Write: Editorial Service, STEEL, Penton Building, Cleveland 13, Ohio.

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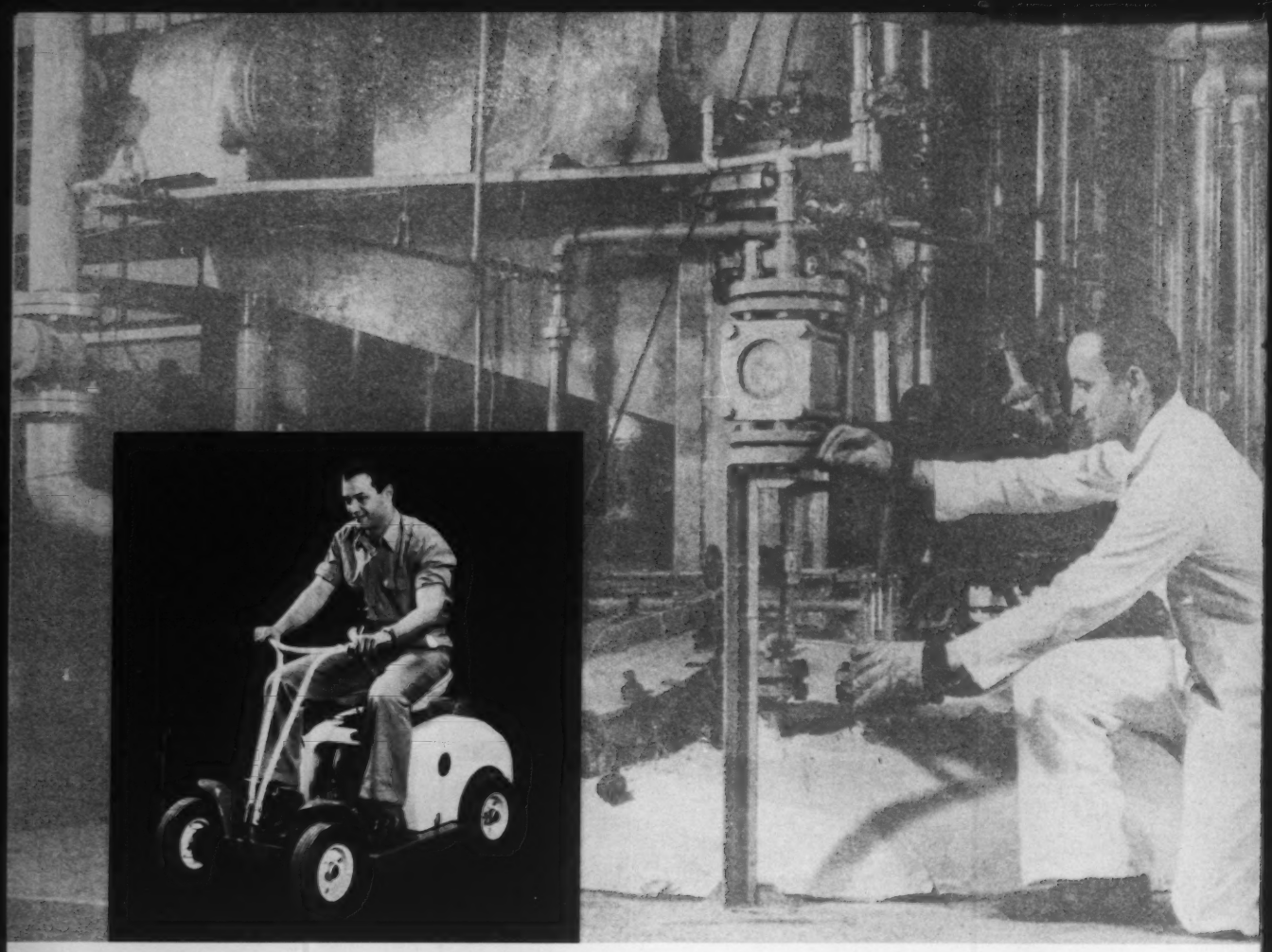

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Goldberg Sets Up New Labor-Management Unit... Report on Automation Ready for President...Guidelines for Growth

He Wears Three Hats At Labor

HARRY WEISS has a new job in the Labor Department: Director, Office of Labor-Management Services. The new office will have nothing to do with collective bargaining. One of its main efforts will be to encourage local and regional labor-management groups seeking areas of co-operation outside collective bargaining. There are two such groups, one in Los Angeles and the other in Bridgeport, Conn. Mr. Weiss suggests his job may be to help develop others.

This is the second new office that Labor Secretary Arthur Goldberg has created. Seymour Wolfbein's Office of Automation & Manpower was the first. Secretary Goldberg also plans to appoint two associate directors of the labor-management services unit—one from labor, one from management.

Mr. Weiss already holds down two other labor jobs—mobilization co-ordinator and assistant executive director of the President's Advisory Committee on Labor-Management Policy. His connection with the latter provides another possibility: The Office of Labor-Management Services could be a formal means for promoting the President's committee recommendations.

● **AUTOMATION REPORT DUE**—Tomorrow (Nov. 28) the President's labor-management group makes its first important report to the President—on automation. Preliminary subcommittee reports have been completed on the relation of wages to prices and the effects of foreign competition on domestic manufacturers.

Observers report committee discussions have been lively, but basically helpful to both sides. Enthusiasts are predicting a whole new concept in labor-management relations will evolve, particularly in light of the President's Council of Economic Advisers' attempt to get workers and executives to understand the problem of keeping the U. S. economy growing, and at a faster rate.

Last week, Council Chairman Walter Heller set up these guidelines for growth: 1. A cut in the unemployment rate, now more than 6.5 per cent of the labor force, to 4 per cent. 2. A rise in industrial production (the present operating rate is figured at 10 to 15 per cent below capacity). 3. An increase in our growth rate from 3.5 per cent a year to 4.5 per cent. 4. Increased spending on physical plant and equipment. 5. Corresponding increases in research, training, and education.

Basic problem: Mr. Heller doesn't think unemployment will drop further than to 5.5 per cent of the labor force by the middle of next year, even though gross national product will rise to $565 billion annual rate.

● **WHAT'S TIMING ON TAXES, TRADE?**—The White House and Congressional leaders are trying to figure out some tough timing problems for the next session of Congress. Take the House Ways & Means Committee where all tax and tariff legislation must begin. The Reciprocal Trade Agreements Act expires June 30, 1962. Just how soon should the administration reveal its program (STEEL, Nov. 13, p. 111) to insure passage before the deadline? Committee sources suggest trade may not come before the committee until late in the spring when it's hoped the national economy will be well along in an expected rise and thus blunt the thunder of the protectionists who claim imports are drastically hurting large segments of the economy. On the other hand, the committee has three important subjects besides trade: Tariff simplification, the tax incentive program, and medical aid. Can it hope to finish all three controversial measures in time to handle trade extension?

Of course, legislative problems don't stop with the Ways & Means Committee. After they clear the House, the hard to please Senate Finance Committee, chaired by conservative Sen. Harry Byrd (D., Va.), may be the biggest hurdle of all.

● **TOUGHER SMALL BUSINESS RULES**—Defense Department, General Services Administration, and Small Business Administration have teamed to put more pressure on prime contractors to share their work with small firms. The new rules call for the primes to consult more with the SBA on the choice of subcontractors, and give the SBA increased power to obtain information from government agencies on their procurement practices. Primes will be required to maintain subcontracting records and operate "active" small business programs on all contracts for over $500,000.

A Look at Europe in 1970

LOOK FOR continued economic improvement in Western Europe and a continuing high level of purchases from abroad by European nations.

That's the central theme of a new study, *Europe's Needs and Resources*, issued by the Twentieth Century Fund. The study looks at 18 nations as one economic entity—Finland, Sweden, Denmark, Norway, Iceland, Ireland, United Kingdom, The Netherlands, Belgium, Luxembourg, West Germany, Austria, Switzerland, France, Spain, Portugal, Italy, and Greece.

For that assemblage of nations, the study sees these developments by 1970:

- A population of 320 million to 325 million—about 9 per cent more than 1955's (the base year for the study).
- Less than 20 per cent of the labor force engaged in agriculture vs. 27 per cent in the early 1950s.
- Unemployment of less than 4 million, or 2.6 per cent of the labor force.
- Employment of 139 million—10 per cent above the 1955 figure.
- An average workweek of 40 to 44 hours, slightly greater than at present.
- Productivity (or average output per manhour) gains of more than 2.7 per cent per year.
- Per capita gross national product of $1067 vs. $747 in 1955.
- Private consumption expenditures of $230 billion, 59 per cent greater than 1955 spending.
- More than 36 million autos in operation—three times as many as in 1955.
- Refrigerators in 53 per cent of European households vs. 10 per cent in 1955.
- Washing machines in 59 per cent of households vs. 15 per cent in 1955.
- A favorable balance of trade of $2 billion or more—which will permit overseas development of raw material sources.

Along with such generally optimistic findings—and the prediction that the 18 nation economic unit will have a GNP of $342 billion in 1970—the study also points out some problems faced by Europe.

- **Productivity**—Progress in productivity has been spectacular, but "per capita income and labor productivity in Western Europe are still less than half what they are in the U. S. and some of the British dominions," says the study. A conservative estimate is that average labor productivity in such advanced nations as Sweden and Switzerland is about 60 per cent that of the U. S. while in such underdeveloped nations as Greece and Portugal, it is little more than 20 per cent.

- **Depressed Areas**—Higher productivity is necessary if the nations of Western Europe are to raise living standards in their depressed areas, says the study. It points out that "every country in Europe has scattered areas of underdevelopment" and that "in Greece, Portugal, Spain, southern Italy, and to a smaller extent in Ireland, poverty and industrial backwardness are widespread." Taken as a group, the 67 million people living in southern Italy and the three other Mediterranean countries have an average purchasing power barely half that of Western Europe and little more than one-third that of the residents of the more prosperous areas, the study reports. It also points up the need for the underdeveloped regions to improve their agricultural productivity and to develop manufacturing industries.

- **Coal, Oil Shortage**—By 1970, the study estimates, Europe's energy deficit will be roughly 25 million tons of coal and the equivalent of another 400 million tons of coal to be imported in the form of crude oil and refined products. The annual import bill will be $7 billion—twice the 1955 figure.

New Steelworks on Saltbush Flats

On the flats near this shipyard, a new steel plant will rise. Broken Hill Pty Ltd. will build the facility, to have an annual capacity of 475,000 tons by 1964. The structural mill will be completed by 1963. Tentatively proposed is a merchant bar mill for completion in 1967. The town of Whyalla, already Australia's biggest shipbuilder, hopes to double its population (to 25,000) by 1970

Norway: Pondering EEC Affiliation

Norway's Foreign Minister Halvard Lange told Parliament that before yearend a decision must be reached on whether the objectives of the nation's negotiations

with the EEC (Common Market) should be membership or association. Prime Minister Einar Gerhardsen told Parliament that to stay outside the EEC would cause enormous problems for the Norwegian economy, so the feasible alternatives are full membership and associate membership.

Germany: Economic Pulse Slowing?

Germany's Economic Ministry has tempered its latest —and still optimistic—predictions. Manufacturers are reducing inventories in what appears to be a shift from a roaring boom to more normal, though still healthy, rates of growth. As a result, domestic orders for steel fell 22 per cent in August, and ingot output in September dropped 10 per cent below the September, 1960, level. Downward adjustments were made in other basic industries. Consumer spending in September, however, was 8 per cent above the year-earlier figure, and foreign trade was up 10 per cent. Orders for capital goods have declined, though output continued to rise. Recent wage negotiations in German industry indicate a trend to increases of 10 per cent. And a predominant labor demand is to shorten the workweek to 42 hours by 1964.

Around the World

AUSTRALIA—Federal elections are coming up Dec. 9. A swing of more than 7 per cent away from the Menzies government would be necessary to unseat the prime minister's party. It's considered highly unlikely . . . An Australian trade ship will visit the Persian and Oman Gulf ports of Southwest Asia in March and April; another trade mission will cover the Middle East and Eastern Mediterranean in early 1962.

CZECHOSLOVAKIA—The nation's STROJIMPORT foreign trade corporation is exporting numerically controlled machine tools to Japan . . . The same outfit is negotiating with French, British, and West German firms for the purchase of a wire mill with an annual capacity of 170,000 tons.

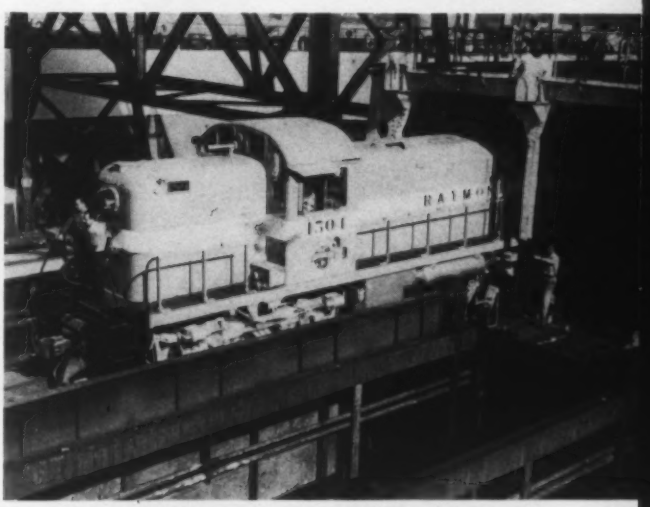
INDIA—The Indian Industries Trade Fair, which opened in New Delhi on Nov. 14 for a seven week run is expected to attract more than 3 million visitors. The gold-domed U. S. exhibit features "working" displays, with a full factory complement of Indian workers running the equipment. Example: A tool and die shop equipped with pneumatic portable tools made by Buckeye Tools Corp., Dayton, Ohio.

GUATEMALA—There's a move afoot to establish a steel plant, since the discovery of iron ore deposits southeast of Chequimula that could reportedly yield 5 million tons during the first five years. The Commerce and Industry Bank of Guatemala City is reportedly interested in helping to finance the project.

GREAT BRITAIN—Falling iron and steel production has reduced the nation's iron ore imports. Overseas purchases during 1961's first nine months totaled 11.9 million tons—12 per cent below the figure for the like 1960 period.

JAPAN—Shibaura Electric Co., Tokyo, is beginning mass production of color TV sets in an attempt to drive its costs down to a competitive level. They're now more than double those of U. S. makers. Eleven Japanese TV stations are broadcasting in color . . . During the First Soviet Trade Fair in Tokyo, which ended in mid-September, Japan sold $21 million worth of goods to Russia, and the Soviets sold $19 million worth to Japan, despite poor attendance. Japanese trade circles say the fair has encouraged greater Japanese purchases of Soviet machine tools, mining machinery, and lumber—and that it has brought about Russian orders for Japanese steel mill products.

PHILIPPINES—Preferences granted to U. S. exporters are being systematically reduced and will be eliminated by 1974. Australia is widening its importance as a supplier of basic metals to the island economy.



Two Complete Railroads Shipped

This locomotive is part of two complete railroads shipped from New York to Liberia via Seatrain Lines. Raymond International Inc. will use one railroad to build a new ocean port, the other to reach the iron ore deposits in the Nimba Mountains. The 12 locomotives, 195 special cars, plus rail and track made up one of the largest shipments of rail equipment on record

Trouble Calls Speeded at Ford's Lima Engine Plant

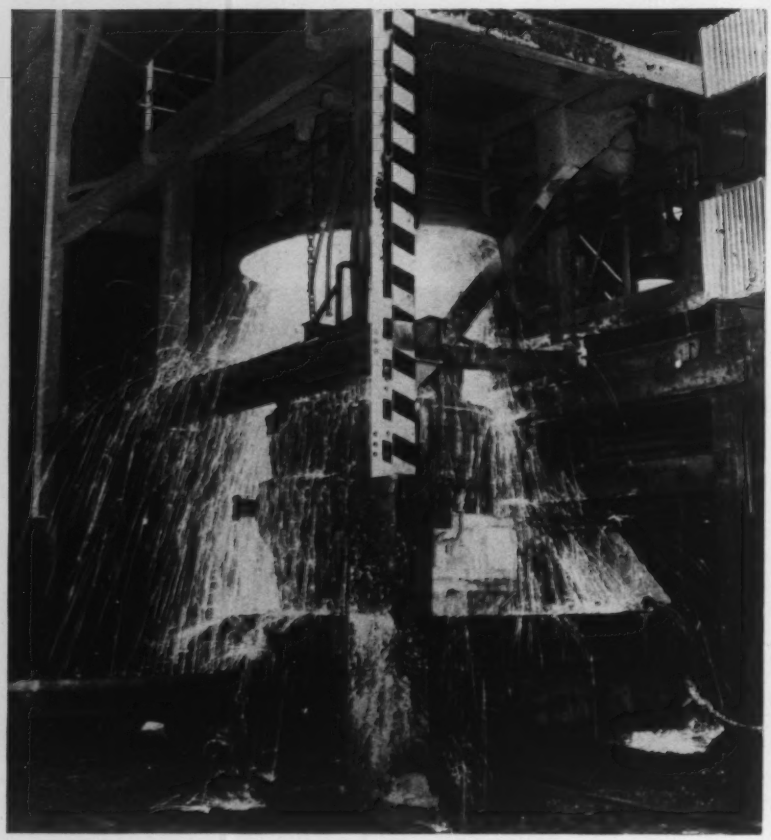
INSTALLATION OF a Telecontrol System in Ford Motor Co.'s Lima, Ohio, engine plant has eliminated the time lag in relaying trouble reports from the cylinder block line. Machine operators can now be linked in a matter of seconds to key management personnel, including the plant manager.

Previously, supervisory and management personnel could easily contact each other, but machine operators, who first experience production difficulties, had to report the trouble by word of mouth to a foreman who might be out of sight or beyond calling distance.

• **How It Works**—The Telecontrol System solves this problem by using signal switches at 40 strategic locations on the production line. By flipping the switch, a control center is alerted to direct the foreman to the trouble spot by page call on a public address system. When he gets there, the foreman plugs in a hand telephone, carried in a waist holster, and asks for the assistance needed.

Although the control center coordinates the action, the plant manager and other personnel can assume control or monitor progress of the situation by two way radios at their desks.

In addition to its troubleshooting role, the control center also keeps tab on operations with digital counters and a graphic recorder which provides a second by second tally.



Oxygen Blowing Improves Ferrochrome

CLEANER charge chrome is said to be produced by oxygen lancing of liquid ferrochrome at the Marietta (Ohio) plant of Union Carbide Metals Co., a division of Union Carbide Corp. The injection agitates the charge and homogenizes the product. It also increases the bath temperature, and makes more time available for removal of impurities.

Selenium Supply Adequate, Report the Producers

SELENIUM producers are hastening to assure users that supplies are ample to take care of any foreseeable demand.

They say rumors of shortages may have been based on U. S. Bureau of Mines statistics which show that producers' shipments exceeded production from 1958 through 1960. Domestic production was supplemented by inventories in the hands of producers and by imports, mainly from Canada. For example, last year, U. S. producers turned out 595,000 lb of selenium, shipped 661,000 lb. This country imported 162,000 lb.

The statistics can be misleading, say the producers. They point out that U. S. producers had an inventory of 273,000 lb at the end of 1960.

In addition, the U. S. Bureau of Mines doesn't report the stocks of selenium held by producers that is not in refined or in salable form. A byproduct of copper and lead refining, selenium intake has been considerably greater than demand for several years. The surplus, which represents several years of production, is being stockpiled by producers as recoverable residues or semiprocessed material.

Demand is down this year. Through the first half, U. S. production exceeded shipments by 75,000 lb, a reversal of the pattern of the last few years.

The recent price trend has been down. The metal is quoted at $6.50 a pound.

GOOD ENOUGH IS PERFECT

Is the stainless steel you are now using in your production over-graded? Is it under-graded? Or, is it producing the end product that meets your exact requirements at lowest possible cost?

Perhaps it's time to take a second look at the type of stainless steel you use, if only to make sure that you're getting the "good enough" that's perfect.

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This team of technicians, including sales and metallurgical specialists, can not only assist you in selecting the proper grade of stainless, but also recommend refinements within the grade to give you material tailor-made to your exact needs.

When can we assist you? Whether you need a small quantity or mill shipments, we can take good care of your requirements from warehouse stocks or through our many mill sources.

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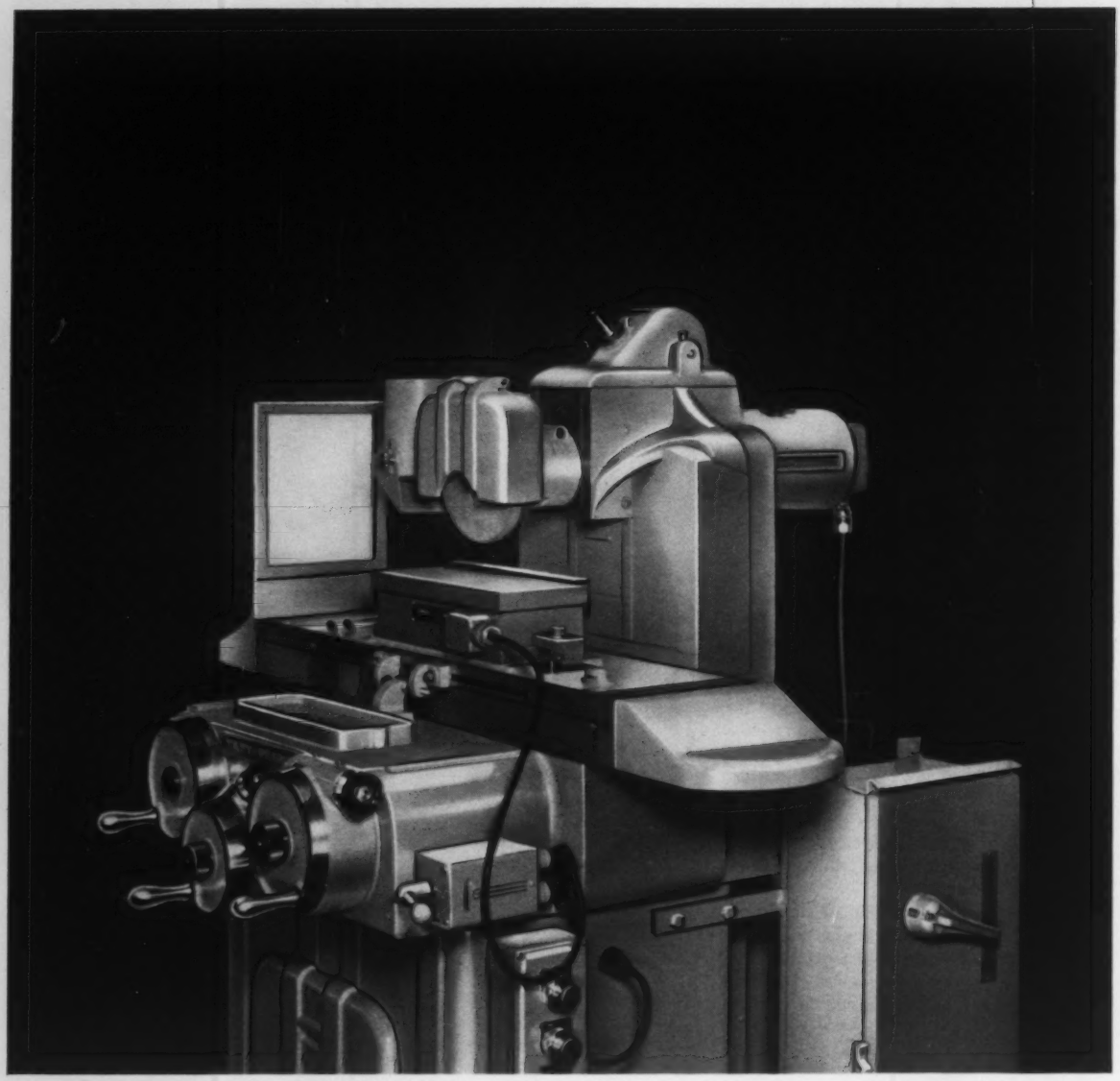

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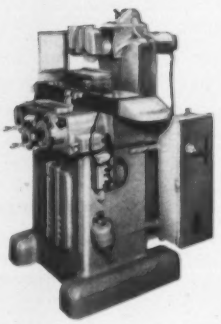

Downfeed accuracy to .000012″. Crossfeed repeatability to .00005″. Tilting wheelhead (0°-30°) eliminates side wheel grinding for slot, undercut, dovetail, sharp corner grinding. .0001″ vernier handwheel graduations. Fine microinch finish with tenth-splitting accuracy maintained on day-in-day-out production. Write for Catalog No. 318.

TAFT-PEIRCE *SURFACE GRINDERS*

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Chrysler's stamping group executive tells how . . .

Simplification Cuts Press Time

Changeover Time Cut	7%
Maintenance Costs Off	5%
Downtime Slashed	5%
Storage Space Reduced	2%
Replacement Inventories Down	1.5%

Those were typical savings for a Chrysler stamping line between 1957 and 1961 model runs.

Joseph D. Quinn

Presses Lose Some of Their Gadgetry

THE NEED FOR foolproof equipment to make components for the rapidly growing variety of car models has caused stampers to remove fancy controls and automated mechanisms from their press lines. They're standardizing on basic loading, unloading, and conveyor equipment that's quickly interchangeable and simple to operate.

In the mid-1950s, carbuilders went gadget happy in efforts to automate stamping lines so that direct labor costs could be cut. But several years of high maintenance costs have shown them that there can be too much automation in some cases. Today's trend is toward simpler equipment.

Chrysler Corp.'s stamping group is an example. Explains Joseph D. Quinn, manager of manufacturing engineering for the group: "With the increased variety of new models, we no longer can set up a press line and expect to run it for a full model year. We may have to make parts for several models on it. We simply can't afford downtime because some gadget won't work after it has been taken down and set up many times. And we can't afford special purpose equipment that isn't interchangeable. We want the simplest automation that will do the job every time."

Adds A. James Savage, manager of Chrysler's Nine Mile (Detroit) stamping plant: "A few years ago, when there were fewer models, as many as eight of our 24 press lines were set up and run for a full model year without changes. Now all of the lines are changed two or three times a week during a model run."

Chrysler has surveyed each of its stamping plants to determine what kind of equipment will "work all the time" no matter how often it's set up. "I'd rather put a couple of men on the line to load and check parts than to fiddle around with a $50,000 piece of automated equipment that needs a maintenance man to adjust it all the time," asserts Mr. Quinn. He points out that the stamping of body sheet metal isn't like machining an engine block. "Sheet steel is flexible. You never know which way it may flop. You can lock a block in a fixture, carry it down a machining line and know it can be held and located properly. But can you imagine clamping each sheet in a fixture and sending it down a door line that stamps out 400 to 600 parts an hour!"

• **Feeders Simplified** — The Nine Mile plant offers an example of the standardization program being completed in each of the company's

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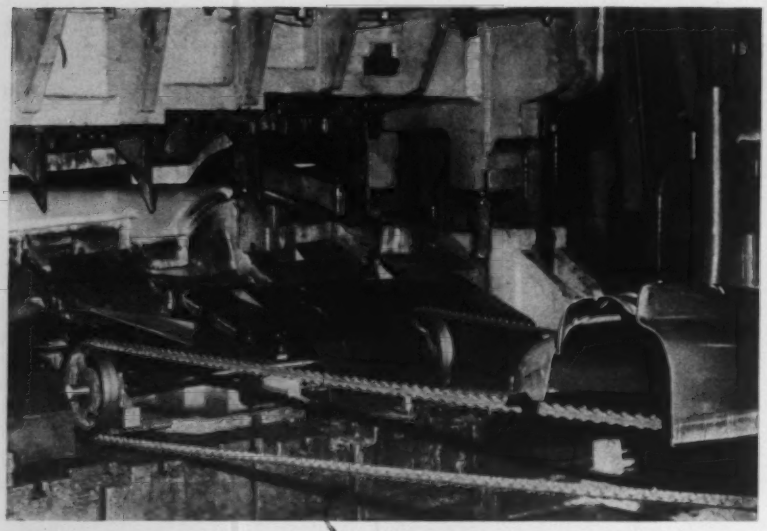

Side belt conveyors, powered by an electric motor, are mounted right on the dies of Chrysler's fender stamping presses. There are no extractors, and the layout features easy access for scrap removal and die maintenance

five stamping facilities. Power feeders are being replaced by gravity feeders on most of the big presses. Instead of limit switches, a simple bar stop is bolted to the upper half of the die. It keeps sheets from sliding into the press before it's ready for them.

Advantages: "We've virtually eliminated feeder maintenance and downtime since the rollers are the only moving parts. Feeders can be placed on top of the dies and stored with them when changes are made. The gravity feeders are safer since there are no automatic controls to get out of synchronization with the press," points out Clement F. Kotwick, plant production engineer. He says that the next move will be to standardize die designs so feeders can be placed closer to the press and bolted directly to the die.

• **Conveyors Changed**—Instead of wide belt conveyors set up on separate stands between presses, the Nine Mile plant has developed side belt conveyors to carry parts from one press to the next. They look much like an oversized pair of bicycle chains connected to V-belt wheels that are mounted directly on the dies.

An electric motor runs the side belts, which can be adjusted for tension. Like the gravity feeders, this type conveyor can be easily taken down and stored with the dies. Setup is simple and fast.

The belts are mounted only inches from the die face instead of several feet away. It means that die ejection pins can often be redesigned so they'll push parts directly onto the conveyor. In some cases, the setup has eliminated mechanical extractors. In other situations, simplified types of extractors can be used. The side belts provide more room for scrap removal and make die maintenance easier.

• **Presses Altered** — Chrysler generally places its triple action presses between double action presses in a line to get more flexibility. Several of the triple action jobs are designed so the second action operates upward from the bottom of the press. Panels are positioned just the reverse of the standard toggle press. Big advantage cited: Body stampings can be formed upside down so the parts are correctly positioned for entry into the trim presses. Complicated turnover equipment and extra handling are eliminated. The Nine Mile plant is using the "upside down" method on four, quarter panel lines and three, roof lines. Mr. Savage says his next step will be to relocate sequencing controls from press pits to floor level. The arrangement will make adjustments easier—an important point when you're changing dies frequently during a model run.

As Chrysler replaces its presses, it will seek heavier tonnages on straight side models. Mr. Quinn adds that the industry trend is toward sliding bolster presses. Chrysler wants them with automatic clamping and tonnage limiters which will aid in cutting changeover time.

• **Lube Standards**—General standards already call for liquid grease instead of oil as a press lubricant because it's cleaner and provides more positive lubrication. The Nine Mile plant has standardized on dry coating drawing compounds for these parts. That tends to eliminate split panels. In the maintenance area, Chrysler finds its standardization program makes for smaller inventories of replacement parts. Few special parts have to be stocked.

Adds Mr. Savage: "One of the biggest advantages from a management standpoint is that the lack of gadgets means less trouble, and less trouble means less talk. We have more time to spend on important production problems and on advanced programing. We don't have to spend all our meeting time figuring out how to debug a line that's not working."

U. S. Auto Output

	Passenger Only 1961	1960
January	415,857	688,690
February	364,385	659,298
March	407,959	654,241
April	446,739	582,869
May	542,303	611,260
June	599,474	613,136
July	399,191	434,377
August	195,266	305,514
September	354,711	407,691
October	557,200	617,972
10 Mo. Totals	4,283,085	5,575,048
November	.....	597,638
December	.....	523,422
Total	.....	6,696,108

Week Ended	1961	1960
Oct. 21	143,150	146,339
Oct. 28	159,136	150,019
Nov. 4	152,855	145,537
Nov. 11	152,286	138,682
Nov. 18	156,313†	149,753
Nov. 25	125,000*	111,091

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

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2. Garia Oils help keep work cooler. Even with high-speed cutting, the metal stays cool.

Cooling helps extend tool life, and helps assure a better finish on the work. Operating costs are lower too.

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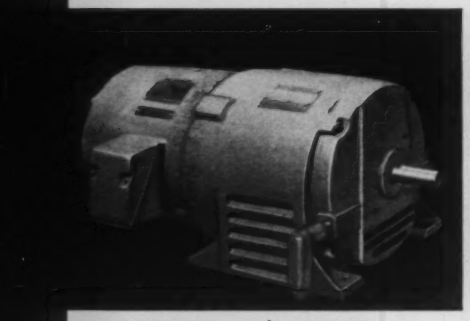

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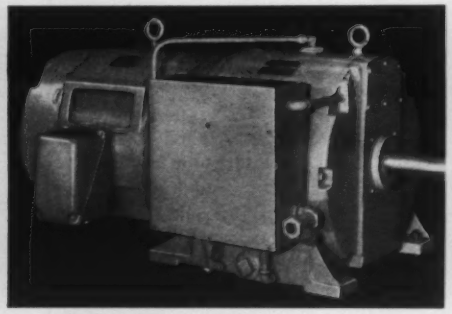

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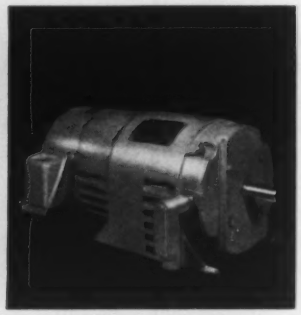

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DIRECT CURRENT MOTOR AND GENERATOR DEPARTMENT

GENERAL ELECTRIC

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Consumer Spending Finally Turns Up

MUCH OF THE CAUTION has gone out of the "cautious optimism" that prevailed throughout most of September and October. Reason: Business reports are once again showing the recovery pattern, but most important is the first sign that the consumer has decided it is time to put his strength behind the upturn.

Take a look at a few of the business news items of the last couple of weeks, and you'll see why the shift in attitudes has been so pronounced:

1. The Federal Reserve Board's industrial production index regained its August peak of 113 (1957 = 100) in October. (See graph and table, Page 88.) Gains were concentrated in the automotive industry, but practically all major segments except steelmaking showed improvement after seasonal adjustments.

2. New orders for durable goods moved up another 1 per cent to a seasonally adjusted $15.9 billion last month.

3. Durable goods sales climbed 2 per cent in October to $15.3 billion, seasonally adjusted.

4. New passenger car sales hit a record for the last ten day selling period of October, then started out in November on a pace that would set a new mark for this month.

5. Starts on new, private houses rose to an annual rate of 1,442,000 (seasonally adjusted) in October, the highest rate since December, 1959.

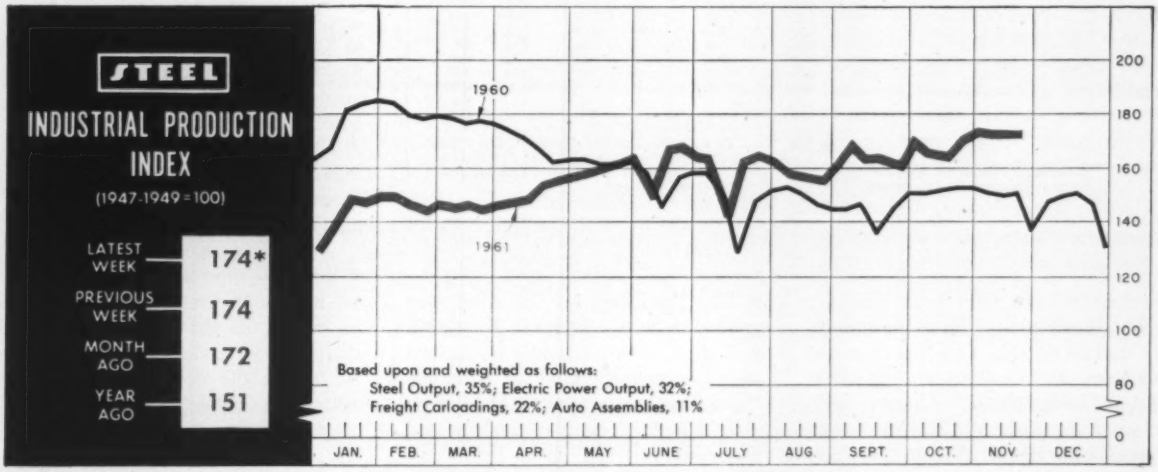
6. But most important of all, retail sales last month jumped significantly to $18.6 billion, seasonally adjusted, nearing the all-time high of $18.9 billion set in April, 1960.

● **No Fluke**—It is too early to verify the turn in consumer spending from a statistical viewpoint—one month doesn't make a trend. In addition, the October figures were influenced no little amount by the auto industry, even after taking account of seasonal factors. But there is substantial statistical basis for believing that what happened last month could be repeated often enough to convince even the most obdurate pessimist that a trend has been established.

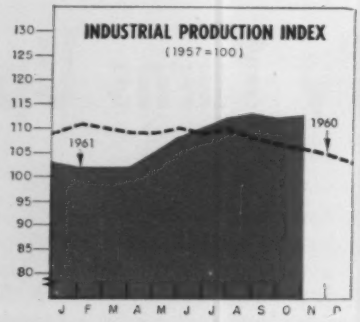
Personal income is still rising. Employment is at all-time high for the period, and the outlook for unemployment is improving. The consumer is highly liquid, from both a savings and a credit position. The workweek is holding close to 40 hours, and overtime is becoming more common. Equally as important as the statistics is the attitude of buyers, which seasoned business observers say is definitely changing for the better.

● **Link in Place**—If the buyer is back, the missing link in the business outlook is in place. In practically every business forecast this fall the main hedge has been: "We'll have a whale of a good year if consumer expenditures, especially for durables, give us sufficient support." While that support appears to be here, it is not uniform throughout the country, just as the over-all upturn has not been uniform. In an informal poll of businessmen in cities across the country, STEEL got these reactions:

● **Pittsburgh**—"There is something of a revival in retail sales going on here," said John J. Balles, vice president and economist for Mellon National Bank & Trust Co. While de-



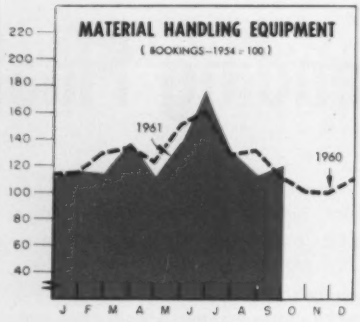
*Week ended Nov. 18.



(Seasonally adjusted)

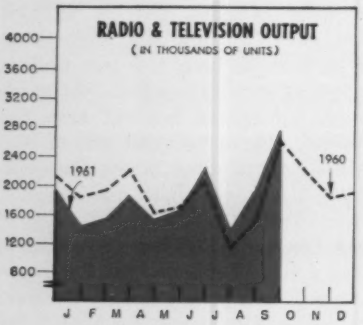
	Total Production		Total Mfg.		Durables Mfg.	
	1961	1960	1961	1960	1961	1960
Jan.	102	111	101	112	95	111
Feb.	102	110	101	110	94	109
Mar.	102	109	102	110	95	108
Apr.	105	109	105	109	99	106
May	108	110	108	110	103	107
June	110	109	111	110	105	105
July	112	110	112	110	107	106
Aug.	113	108	113	108	108	104
Sept.	112	107	111	107	106	102
Oct.	113*	106	113*	106	108*	101
Nov.	...	105	...	104	...	98
Dec.	...	103	...	103	...	96
Avg	...	108	...	108	...	104

Federal Reserve Board. *Preliminary.



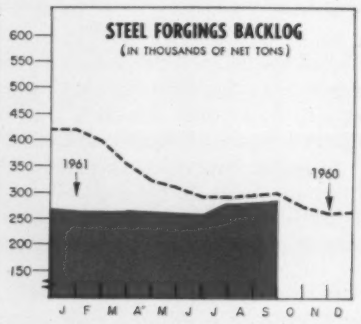
	1961	1960	1959	1958
Jan.	116.24	114.96	115.84	93.07
Feb.	114.39	128.74	124.77	93.49
Mar.	136.96	133.60	146.36	97.89
Apr.	109.85	122.41	147.28	122.36
May	136.47	150.33	164.45	118.04
June	175.51	160.23	170.72	131.15
July	130.72	126.79	130.26	134.34
Aug.	113.28	131.33	87.02	104.46
Sept.	120.82	111.11	126.43	85.41
Oct.	...	99.89	131.09	111.35
Nov.	...	98.96	124.16	110.88
Dec.	...	110.00	113.78	105.97
Avg	...	122.55	131.85	109.87

Material Handling Institute Inc.



	Radio		Television	
	1961	1960	1961	1960
Jan.	1,090	1,356	368	526
Feb.	1,115	1,442	444	503
Mar.	1,384	1,668	497	550
Apr.	1,125	1,230	406	423
May	1,197	1,277	470	442
June	1,626	1,551	615	519
July	1,030	890	383	269
Aug.	1,385	1,048	515	462
Sept.	2,049	1,945	695	679
Oct.	....	1,728	...	500
Nov.	....	1,469	...	430
Dec.	....	1,522	...	405
Totals	....	17,126	...	5,708

Electronic Industries Association.
Charts copyright, 1961, STEEL.



	Shipments		Unfilled Orders	
	1961	1960	1961	1960
Jan.	95	123	266	420
Feb.	89	130	263	398
Mar.	96	138	262	356
Apr.	96	117	264	325
May	105	110	262	312
June	108	110	259	295
July	72	79	280	295
Aug.	97	88	281	299
Sept.	99	94	283	302
Oct.	...	97	...	277
Nov.	...	93	...	265
Dec.	...	90	...	268

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

partment store sales have fluctuated somewhat, they have been mostly on the up side. October appeared to be a solid indication that better things were ahead. Already, merchants are pushing Christmas sales, which may distort the picture somewhat.

• **San Francisco** — "October was good out here," declared Raymond E. Zelder, chief, business conditions and forecasting, Bank of America. "The fourth quarter should be even a little better. Both November and December should show some improvement, although it won't be as great as in October." Department store sales are about in line with the national figures (they've been even with or ahead of the year-ago levels for nine consecutive weeks) and auto sales about match the fast national pace.

• **Atlanta**—Auto demand is up noticeably (there are spot shortages), but department store sales are too spotty to indicate a trend. Moderate optimism is prevalent, though, and one leading businessman told STEEL, that both November and December should rise above the October level of consumer sales. "October was good, but not quite as good as we had expected," he reported to STEEL.

• **Boston**—Department store sales in the second week of November dipped below the year-ago level, but it was because of the first observance of Veterans' Day as a state holiday. Otherwise, business "isn't bad, but it is still uncertain," stated Benjamin F. Stacey, vice president of the First National Bank of Boston. "Things are somewhat better than they were 30 or 60 days ago, but not a great deal." Mr. Stacey offered the observation that perhaps the retail sales figures for the last few months may have understated the true conditions. "If you consider the impact of compact autos on retail sales figures, you may be anywhere from $50 million to $100 million below the level you would have if those had been full sized cars," he said.

• **Dayton, Ohio** — Optimism is growing in this industrial city. Unemployment at last count was down to 3.5 per cent of the working force. Retail sales, especially autos, have been strengthening. "The turn has come in consumer spending in Dayton," observed Thomas Olberding, manager of business research for the Dayton Area Chamber of Commerce.

• **Detroit**—One of the cities hardest hit by the recession and again by strikes in the postrecession period, Detroit is also one of the slowest to feel the upturn in consumer confidence. Department store sales have been erratic, averaging out to just a shade beneath the year-ago totals in recent weeks. Auto sales

look good, but fleet sales play an important part in the figures and may cover up the true trend. The pattern of credit repayment and savings is still strong, indicating a hesitancy on the part of the consumer. But unemployment at latest count was 8 per cent, "the lowest of the year," stated T. Donald Rucker, of the Greater Detroit Board of Commerce.

On the other hand, Charles S. Ricker, assistant vice president of the National Bank of Detroit, opined that the consumer is acting about as expected for this stage of the recovery. He isn't quite as hesitant as he was 90 days ago, and the signs point to a loosening up in coming months. "At a meeting of bankers from all over Michigan last week, the outlook was basically optimistic," he told STEEL. "We'd say the October figures on retail sales were the start of a genuine consumer buying upturn."

● **St. Louis**—There is a slow change in consumer attitudes in St. Louis. Car sales are below the national trend, but appliances seem to be moving well. Nondurables are beginning to move better. Merchants are pushing Christmas sales earlier than usual to try to recoup some of their early fall losses—blamed partly on unseasonable weather. One area economist told STEEL: "As far as St. Louis is concerned, I think the October retail sales figures were a fluke. While I expect November and December sales to look pretty good, they won't be anything like last month's. I have revised my gross national product figure for next year down to $540 billion because I don't think consumer buying will rise fast enough to support any higher level."

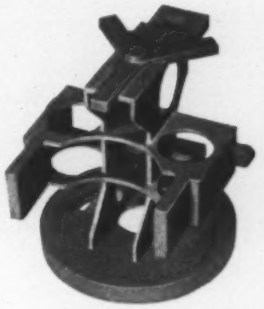
● **Balance Favorable**—On balance, the above reports are on the optimistic side. If the turn has really come, Prentice-Hall Inc., Englewood, N. J., says: "Buoyant demand at retail will result in a renewed spurt of inventory accumulation at both factory and retail levels . . . Anxiety about consumer spending will now subside, but not altogether disappear. A good year for durables is ahead, and records will topple. Yet, while replacement calls will be heavy, net increments to the huge stock of hard goods held by consumers will probably be slim. So next year's advances may not press strongly enough against capacity to give rise to substantial new plant and equipment spending."

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)	2,015[1]	2,037	1,367
Electric Power Distributed (million kw-hr)	15,600[1]	15,520	14,435
Bituminous Coal Output (1000 tons)	8,635[1]	8,785	7,513
Crude Oil Production (daily avg—1000 bbl)	7,175[1]	7,178	6,968
Construction Volume (*ENR*—millions)	$533.7	$255.4	$473.6
Auto, Truck Output—U. S., Canada (*Ward's*)	191,598[1]	186,549	179,928
TRADE			
Freight Carloadings (1000 cars)	590[1]	605	567
Intercity Truck Tonnage (changes from year ago)	+13.6%	+8.7%	−6.0%
Business Failures (Dun & Bradstreet)	336	344	298
Currency in Circulation (millions)[2]	$33,223	$32,968	$32,527
Dept. Store Sales (changes from year ago)[2]	+4%	+3%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$28,993	$26,233	$26,029
Federal Gross Debt (billions)	$295.9	$295.9	$290.5
Bond Volume, NYSE (millions)	$34.4	$31.4	$24.7
Stocks Sales, NYSE (thousands of shares)	21,900	19,283	13,969
Loans & Investments (billions, adjusted)[3]	$116.9	$117.5	$108.0
U. S. Govt. Obligations Held (billions)[3]	$33.8	$34.1	$29.3
PRICES			
STEEL's Finished Steel Price Index[4]	247.82	247.82	247.82
STEEL's Nonferrous Metal Price Index[5]	223.5	223.5	222.1
All Commodities[6]	118.7	118.5	119.6
Commodities Other than Farm & Foods[6]	127.4	127.3	128.0

*Dates on request. [1]Preliminary. [2]Federal Reserve Board. [3]Member Banks, Federal Reserve System. [4]1935-39=100. [5]1936-39=100. [6]Bureau of Labor Statistics Index, 1947-49=100.

THE FREEDOM DIMENSION



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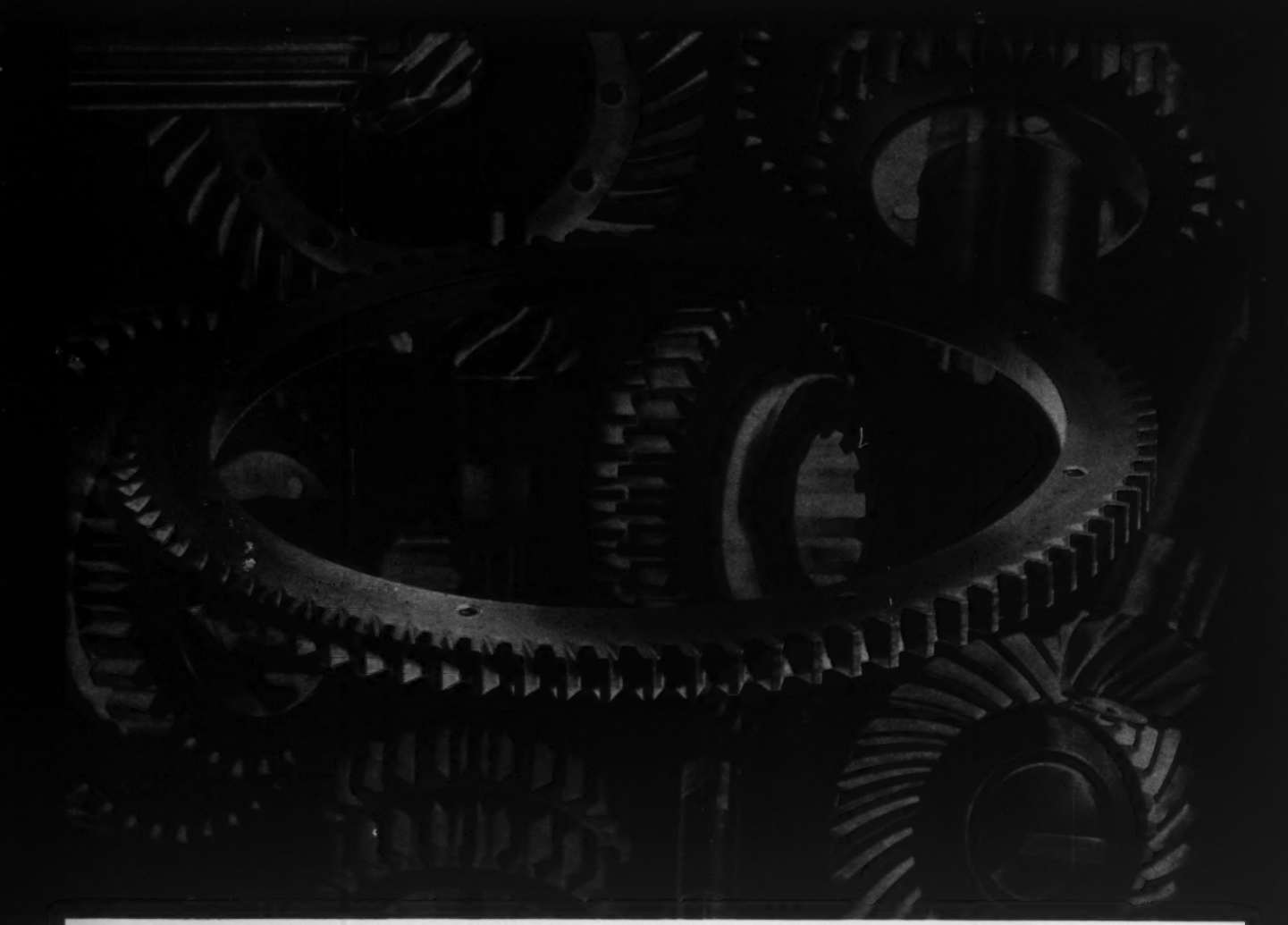

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- ☐ SPLINE SHAFTS
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HOWARD F. CARVER
Gleason Works v. p.

EDWARD A. CLEARY JR.
Warner Electric Brake exec.

EDWARD E. McGINLEY
joins Phoenix Steel

JAMES H. WALDRON
Despatch Oven purchasing dir.

Howard F. Carver was appointed vice president and general manager, **Gleason Works**, Rochester, N. Y. Previously a vice president, he had also been assistant general manager.

Edward A. Cleary Jr. fills the new post of executive vice president at **Warner Electric Brake & Clutch Co.**, Beloit, Wis. He has been vice president-operations since 1958.

T. Phillips Morgan fills the new post of vice president and director of operations, **Consolidated Systems Corp.**, Monrovia, Calif.

Russel A. Schlegel was appointed president, **Republic Flow Meters Co.**, Chicago, subsidiary of Rockwell Mfg. Co., effective Dec. 1, when **W. F. Crawford** relinquishes the post but continues as a director. Mr. Crawford is also president of Edward Valves Inc. and vice president of Rockwell. Mr. Schlegel was vice president and general manager of Daystrom Inc.'s Weston Instruments Div.

Edward E. McGinley was made manager of operations for all plants of **Phoenix Steel Corp.**, Phoenixville, Pa. He was assistant general superintendent of U. S. Steel Corp.'s Edgar Thomson Works, Braddock, Pa.

John Suerth joined **DoAll Co.**, Des Plaines, Ill., as product manager for cutting oils, lubricants, and coolants.

Ekco-Alcoa Containers Inc., Wheeling, Ill., elected as vice presidents: **John W. Carlile**, vice president-marketing; and **Jack B. Blane**, vice president-engineering.

Howard Stephens was made assistant to vice president-sales at **Wheeling Steel Corp.**, Wheeling, W. Va. He was president of Berry Steel Corp., Roselle, N J.

Norman Ginsburg was elected executive vice president and treasurer, **Burgmaster Corp**, Gardena, Calif. He was vice president-treasurer.

James H. Waldron was appointed director of purchases at **Despatch Oven Co.**, Minneapolis, to succeed **C. J. Flinn**, retiring.

George J. Meyers Jr. was elected vice president, **Hofmann Industries Inc.**, Sinking Spring, Pa. He was executive vice president of Reading Tube Corp.

Robert H. Wright was made New York district sales manager, **Aluminum Co. of America**, to succeed **J. Colin Smith**, recently made managing director of Alcoa of Australia Pty. Ltd.

Leo Catallo, Detroit factory manager, was elected a vice president of **Wheel Trueing Tool Co.**, Detroit. He retains the duties of product development and engineering.

Paul C. Ewbank was named executive vice president, **Union Steel Products Co.**, Albion, Mich. He was vice president and assistant general manager, and now co-ordi-

RUSSEL A. SCHLEGEL
Republic Flow Meters pres.

HOWARD STEPHENS
Wheeling Steel sales post

NORMAN GINSBURG
Burgmaster exec. v. p.

PAUL C. EWBANK
Union Steel Products exec.

RALPH C. DONOVAN

CHARLES E. WEBBE

Anaconda Metal Hose Div. appointments

HORACE GELINAS

J. E. MURNANE

Electric Machinery Mfg. positions

nates company divisions and diversified lines.

Ralph C. Donovan was named works manager, **Anaconda Metal Hose Div.**, Waterbury, Conn., Anaconda American Brass Co. He succeeds **Charles E. Webbe**, appointed general manager of the division to succeed **A. B. Freeman**, vice president, retiring Dec. 1.

Thomas V. Cooper Jr. was appointed vice president and director of marketing for **Datatrol Corp.**, Silver Spring, Md.

H. J. Meany was promoted to a vice presidency with **Norris-Thermador Corp.**, Los Angeles. He retains the post of vice president-general manager of the Thermador Div.

Stanley E. Soule was named executive vice president of **Soule Steel Co.**, San Francisco, a new post. He was vice president-marketing. He now is responsible for operations of the company's four product divisions.

Horace Gelinas was named manager of manufacturing and a member of the management committee of **Electric Machinery Mfg. Co.**, Minneapolis. He succeeds **G. W. Sjoquist**, retiring Dec. 1. **J. E. Murnane**, director of purchases, fills the new post of manager of materials.

Gustave A. Linenberger was made vice president-general manager, **Aerojet-General Nucleonics**, San Ramon, Calif., subsidiary of Aerojet-General Corp. **Chandler C. Ross**, managing AGN for more than a year, returns to duties as vice president-engineering for Aerojet-General at corporate headquarters in Azusa, Calif.

Kenneth A. Kirby was made director of industrial relations, **Selas Corp. of America**, Dresher, Pa.

W. C. Meyer was appointed assistant to the vice president, **Crucible Steel Co. of America**, Pittsburgh. He will direct purchasing and traffic. He had served in various purchasing capacities with Westinghouse Electric Corp.

Ernest F. Upton Jr. was made director of engineering, **Fischer & Porter Co.**, Warminster, Pa. He was engineering director of Weston Instruments Div., Daystrom Inc.

Richard A. Vollmer was made director of financial planning and control for **Westinghouse Electric Corp.**, Pittsburgh.

Clifford E. P. Smith was made manager of cargo container systems for **Heil Co.**, Milwaukee. He heads the new Cargo & Van Container Dept., Plastics Div.

Howard W. Locker Jr. joined **Michigan Oven Co.**, Detroit, as chief engineer. **Charles Percival Jr.** was made Eastern regional sales manager; **Joseph M. Halloran Jr.** district manager, New England sales area. **A. N. Mason** joins the company as district manager, metropolitan New York and northern New Jersey.

H. J. MEANY

Norris-Thermador v. p.

STANLEY E. SOULE

Soule Steel exec. v. p.

W. C. MEYER

Crucible-asst. to v. p.

HOWARD W. LOCKER JR.

Michigan Oven chief eng.

Donald H. Thure was elected executive vice president and general manager, **Bingham Stamping Div.**, Toledo, Ohio, Van Norman Industries Inc. He joined the company as works manager in 1957. **Paul C. Eberhardt** was elected executive vice president of Van Norman's **Super Tool Co.**, division in Elk Rapids, Mich.

J. S. Allt was named executive vice president and treasurer, **Leece-Neville Co.**, Cleveland. **Albert Goodrich** was named assistant secretary and assistant treasurer.

Thomas H. Maddux was made general sales manager, **Master Power Corp.**, Solon, Ohio, a Black & Decker Mfg. Co. subsidiary.

P. Malcolm Smurthwaite was made manager of the Oxweld Factory in Newark, N. J. of **Linde Co.**, division of Union Carbide Corp. He succeeds **William E. Dwyer**, retired. **Eugene V. Yuhasz** replaces Mr. Smurthwaite as assistant factory manager at Oxweld.

Filling newly created posts at **Climax Molybdenum Co.**, Refractory Metals Div., Detroit, are: **Robert R. Freeman**, made manager of marketing; **Norman L. Deuble**, made assistant to the general manager; **Clements H. Kromer**, made financial manager.

Earl Cunningham was named vice president-sales and marketing at **Cimron Corp.**, San Diego, Calif.

William A. Campbell was elected president and general manager, **Wallace Barnes Co. Ltd.**, Hamilton, Ont., subsidiary of Associated Spring Corp. He succeeds **Robert M. Buchanan**, recently transferred to the corporation's Seaboard Pacific Div., Gardena, Calif., as general manager.

Pontiac Motor Div., Pontiac, Mich., General Motors Corp., named **Martin F. Rummel** director of purchasing and production control; **Homer C. Jackson** director of purchasing, reporting to Mr. Rummel; and **Dennis P. Duross** production manager succeeding **Ray J. Longpre**, retired. In Pontiac's Engineering Dept., **J. Z. DeLorean** was made chief engineer, and **J. P. Charles** executive assistant chief engineer.

DONALD H. THURE
Bingham Stamping exec. v. p.

J. S. ALLT
Leece-Neville exec. v. p.

THOMAS H. MADDUX
Master Power sales post

ROBERT GOSSETT
Aluminum Extrusions post

CARLE VANDE BOGART
Frederic B. Stevens post

JAMES K. NYBURG
joins Micro Metals

Robert Gossett was made plant engineer for **Aluminum Extrusions Inc.**, Charlotte, Mich.

Carle Vande Bogart was made foundry sales manager, **Frederic B. Stevens Inc.**, Detroit, to succeed **Eugene Passman**, resigned.

R. O. Fish was made general superintendent of **Harnischfeger Corp.'s** three major departments at the main plant in West Milwaukee, Wis. He is in charge of originating departments responsible for forging and cutoff; casting preparations; and sheet metal, fabrication, and welding operations.

Carl Brownfield was made director of purchases, **American LaFrance**, Elmira, N. Y., a division of Sterling Precision Corp. **John F. Murphy** was made director of manufacturing; **Arthur J. Berry** assistant to the president.

Michael J. Wilms was made sales manager, **Lindberg Steel Treating Co.**, Melrose Park, Ill.

James K. Nyburg, former general sales manager for Easton Metal Powder Co., was named general sales manager of **Micro Metals Corp.**, Passaic, N. J.

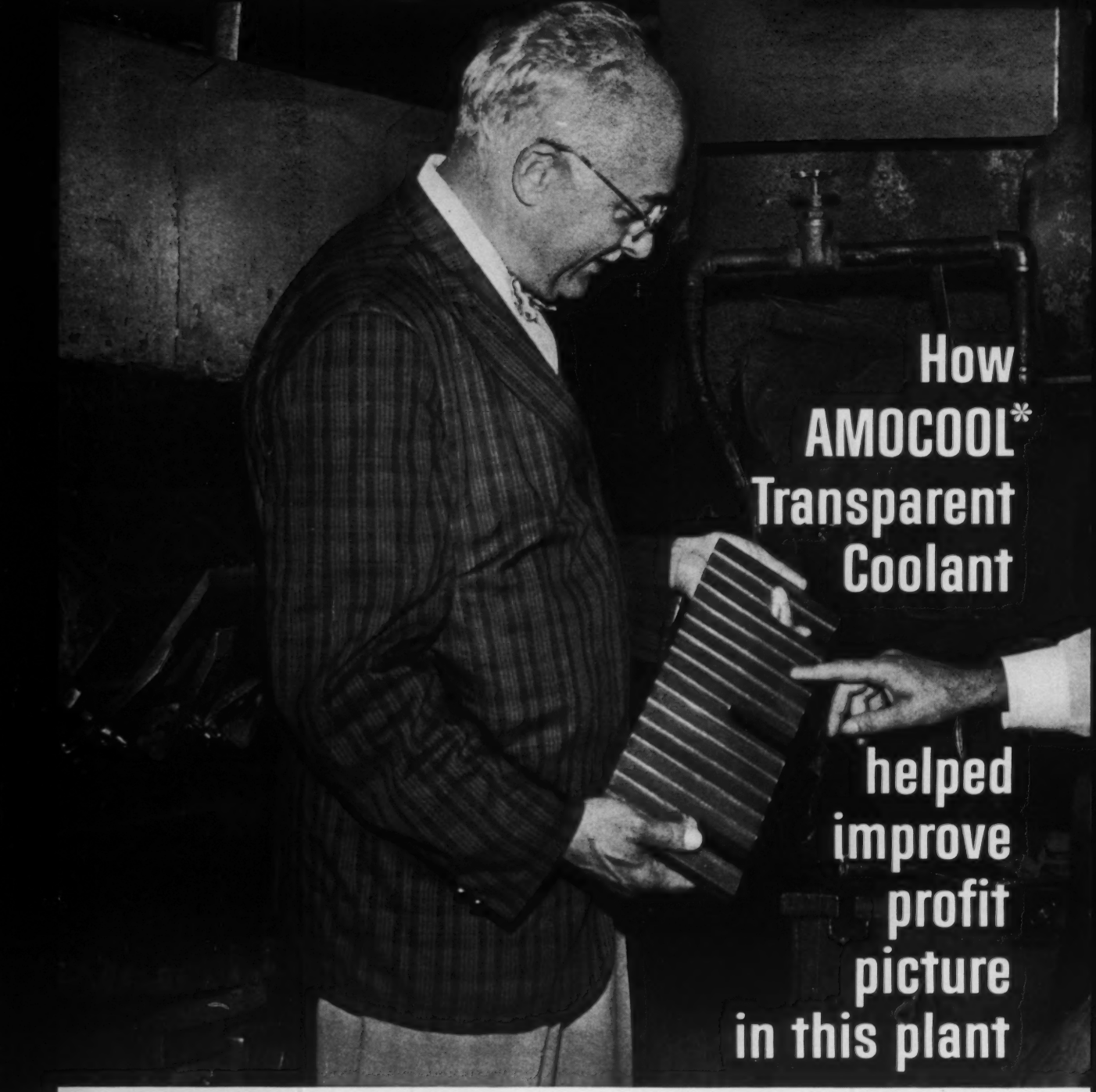
Robert A. Kraus was named chairman of the Mechanical Maintenance Committee of **Republic Steel Corp.**, Cleveland. He continues as superintendent of construction for the Warren, Ohio, steel plant. As committee chairman, he succeeds **R. F. Armitage.**

OBITUARIES...

J. William Robinson, 59, a vice president of **Leeds & Northrup Co.**, Philadelphia, and joint managing director of Leeds & Northrup Ltd., England, died Nov. 6.

Carl R. Weidenmiller, 72, president, **Washburn Wire Co.**, New York, died Nov. 17.

William J. Meinel, 68, chairman and former president, **Heintz Mfg. Co.**, Philadelphia, died Nov. 18.



How AMOCOOL* Transparent Coolant helped improve profit picture in this plant

*Trademark

BY PAUL E. "PAPPY" STRATTON

About the Author. "Pappy" Stratton has been providing technical help on lubrication and metalworking problems to customers in the Detroit area for nearly all of the twenty-five years he has been working for the company. In addition to having this store of practical experience to help him, Pappy has completed the Company's Sales Engineering School.

* * *

By using a soap-base grinding compound, Detroit Edge Tool Company was getting excessive corrosion and rust on work and grinding machines. Oil vapor was collecting on machines and on the ceiling, causing dirty working conditions. Most important, high wheel loading was causing frequent down-time for wheel dressings.

We worked out a test program on AMOCOOL Transparent Coolant with the management. On our first test on one surface grinder, feed pressure was cut substantially while at the same time metal removal was increased.

Eliminate reworking because of rust, reduce wheel loading and extend intervals between wheel dressings; do these and you increase profit per unit, explains Detroit Edge Tool president, Dan Ebbing, to P. E. "Pappy" Stratton of American Oil. Plant manager, John Yonker (right) and Sam Vineh, operator, look on.

The cost of reworking parts to remove rust was eliminated. Time required to clean machines to get rid of the odor was cut in half. Less wheel loading and fewer wheel dressings have upped production and reduced costs. Our test program paid out in an improved profit picture. All grinding and drilling equipment has been converted to AMOCOOL Transparent Coolant.

* * *

Would you like this kind of technical help to assist you in improving profits? Get it by calling the American Oil Company office nearest you.

Quick facts about

AMOCOOL
Transparent Coolant

- Clear, transparent fluid
- Controls corrosion on work and machines
- All chemical. Does not support bacteria growth
- Unaffected by humidity
- Fire resistant
- Odorless

AMERICAN

AMERICAN OIL COMPANY
910 South Michigan Avenue
Chicago 80, Illinois

Product Variety Stressed In Air Separation Plant

OXYGEN is the major product of the new $10 million facility put into operation at Cleveland by Air Products & Chemicals Inc., Allentown, Pa. But several other materials available from the plant are in demand, or have excellent market potential.

The plant, which is headquarters for the company's Cleveland district sales office, will also produce nitrogen, argon, and neon.

• **Mostly for Steelmaking** — The plant will turn out about 600 tons of liquid and gaseous oxygen, nitrogen, argon, and neon daily. Of that output, 500 tons of gaseous oxygen per day will be available to Jones & Laughlin Steel Corp., for use in its new, basic oxygen steelmaking shop. The high purity product will be delivered through a direct pipeline from the separation plant. The two, large, basic oxygen furnaces will use about 1800 cu ft of oxygen per ton of steel produced.

The remainder of the plant's output—about 100 tons a day—will be used by Air Products & Chemicals to fill Cleveland area orders from many consumers, including hospitals, metalworking plants, and chemical or electronic industries.

Some of the oxygen—stored as a liquid—will serve as a backup supply for the J&L melt shop.

• **Argon in Demand**—Growing use of argon as an inert atmosphere for casting (see STEEL, Sept. 11, p. 110) makes recovery and marketing of the gas worthwhile. Crude argon is delivered from the Cleveland plant.

Pouring through an argon shroud protects the teem stream; it is said to improve performance of ingots and castings.

• **Nitrogen Has Potential**—Collection of nitrogen isn't emphasized at the Cleveland facility. But the liquefied gas is available, and collection could be stepped up.

The presence of four times as much nitrogen as oxygen in the atmosphere (and its availability at modest cost when air is liquefied and fractionated to recover oxygen) make that gas a natural for heat treating and other inert gas uses.

Air Products & Chemicals will put another air separation plant on stream soon at the Sparrows Point (Md.) plant of Bethlehem Steel Co. Its consumption of nitrogen will exceed that of oxygen. The plant will turn out 350 tons of oxygen daily for open hearth lances. But it will also produce 450 tons of nitrogen a day for heat treating or other metallurgical uses.

• **Neon for NASA**—Unusual applications for neon, krypton, and even xenon promise to increase the use of those rare gases, which can be collected at the Cleveland facility. Example: Neon collected at Cleveland will be purified at the company's Allentown facility and delivered to the National Aeronautics & Space Administration (NASA) for use as a cryogenic refrigerant.

About 100,000 cu ft of the gas will cool a magnet that's to be built at NASA's Lewis Research Center (Cleveland) for studies in magnetohydrodynamics (MHD) — a potential power source or propulsion method for space travel. Previously, total annual consumption of neon was about 5000 cu ft.

Operation of the magnet at extremely low temperature (neon boils at about −411° F) is said to reduce power requirements from 200 megawatts to 1 megawatt. Helium had been considered as a refrigerant because it is less expensive than neon. But neon was chosen because its use makes possible a reduction in over-all system cost.

Firms Combine Marketing

Sales and marketing organizations of Pyronics Inc., Cleveland, and Western Products Inc., New Castle, Ind., have been combined to offer a more complete line of industrial combustion equipment.

Both firms will continue research and manufacturing operations. Pyronics' sales and engineering distributor organization will handle all field sales activities. R. M. Buck, president of Pyronics says: "The types of equipment we offer have been increased 30 per cent by this move and we expect sales to increase at least that much the first year."

Dominion Foundries Allots $16 Million for Expansion

Directors of Dominion Foundries & Steel Ltd., Hamilton, Ont., have approved an expansion program expenditure of $16 million for 1962. The program includes additions to steelmaking, hot and cold rolling, and other finishing equipment. It also includes a new main office to be erected on Burlington Street, Hamilton.

Ford Expanding Plant

Ford Motor Co., Dearborn, Mich., has launched a major expansion program at its Louisville assembly plant. Areas totaling about 90,000 sq ft will be added to the more than 1,720,000 sq ft of operational floor space at the plant. Trucks and Ford Galaxie passenger cars are assembled at the plant. Completion target is mid-1962.

Firm to Change Name

Subject to approval of stockholders on Jan. 23, 1962, American Steel Foundries, Chicago, will change its name to Amsted Industries Inc. Acquisitions and new product development in recent years have taken the company into the production of roller chains and sprockets, small precision machine tools, cast iron pressure pipe for water mains, and the application of protective coatings to steel pipe for the oil and gas industries.

To preserve the commercial value of the original name, the Transportation Equipment Div. and the Hammond Div. will be operated as American Steel Foundries Inc.

License agreements have been signed recently with McLouth Steel Corp., Detroit, and Carpenter Steel Co., Reading, Pa., covering the controlled pressure pouring process for direct casting of semifinished mill shapes.

NEW PLANTS

National Cylinder Gas Div., Chemetron Corp., Chicago, is erecting a plant at Tampa, Fla., with a daily capacity for producing 35 tons of air separation products, including oxygen, nitrogen, and argon.

Pittsburgh Metals Purifying Co., Mars, Pa., will construct a $500,000 plant in the Saxonburg area of Butler County, Pennsylvania. The company makes exothermic products used principally in the steel and foundry industries.

Permco Metal Fabricators Inc. has opened its plant in Lowellville, Ohio, for the production of steel closures, fallout shelters, guard rails, and other items.

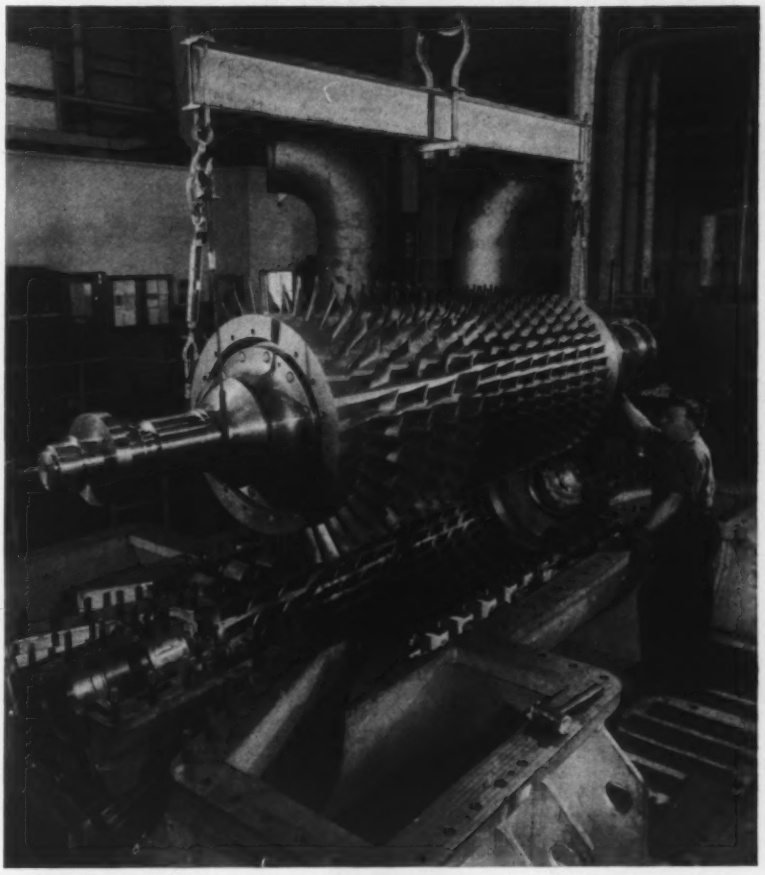
Dixon Chemical Industries Inc., Clifton, N. J., has made the first shipments of hydrofluoric acid from its 11,000 ton plant at Paulsboro, N. J.

ASSOCIATIONS

Industrial Perforators Association is being formed to establish industry standards for perforated metals of all types. D. E. McKey, McKey Perforating Co. Inc., Milwaukee, is temporary chairman of the organization committee which is composed of representatives of these additional companies: National-Standard Co., Diamond Mfg. Co., Hendrick Mfg. Co., Johnson & Chapman Co., Laubenstein Mfg. Co., National Perforating Corp., and Toepfer & Sons Inc. All perforating companies are invited to attend the group's next meeting, Dec. 13, at the Penn-Sheraton Hotel, Pittsburgh.

G. E. Gregory, Gregory Industries Inc., Lorain, Ohio, has been elected president of the **Powder Actuated Tool Manufacturers' Institute Inc.**, New Haven, Conn. Alvin G. Lane is executive director.

L. W. Firstenberger, Fiese & Firstenberger Mfg. Inc., Fresno, Calif., was elected president of the **Vertical Turbine Pump Association**, Pasadena, Calif.



Adjustable Stator Blower under Test

MORE EFFICIENT delivery of large volumes of air is expected from an axial flow compressor that is being tested at Allis-Chalmers Mfg. Co., Milwaukee. Adjustable stator blades make it possible for the compressor to operate over a wide volume range. The blower was built by **Allis-Chalmers** for blast furnace service at one of United States Steel Corp. plants.

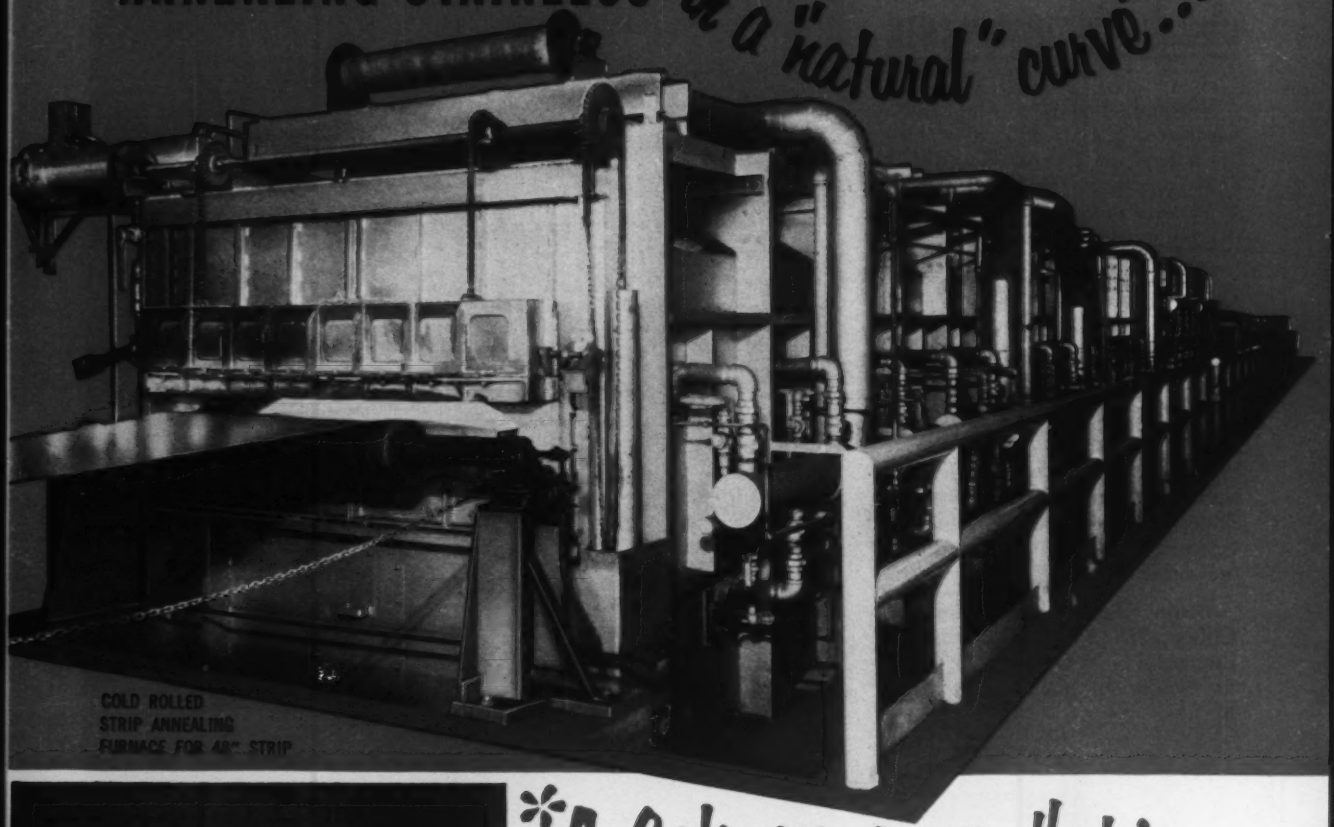
NEW ADDRESSES

General Motors Corp. moved the offices of its **Ternstedt Div.** to 30007 Van Dyke Ave., Warren, Mich. The division's plants are in Flint, Mich.; Columbus, Ohio; Trenton, N. J.; and Detroit.

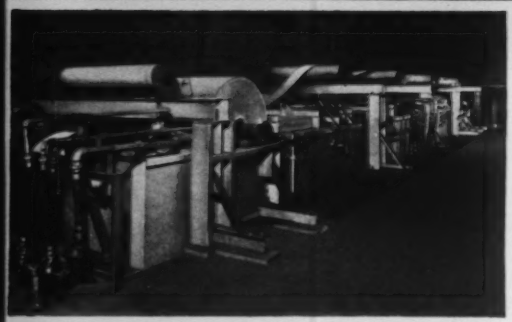
Western Gear Corp., Lynwood, Calif., is moving its **Heavy Products Div.** to Everett, Wash. L. A. Myhre, vice president, is manager of the division. The Everett property, formerly the Everett-Pacific Shipyard, was purchased a year and a half ago from the federal government. The plant will produce deck machinery, steering mechanisms for vessels, rolling mill machinery, equipment for the forest products industry, and cable laying equipment designed for shipboard installation.

Precision Extrusions Inc., Bensenville, Ill., moved a district sales office to 2600 Conner Ave., Detroit, Mich. The firm is a designer and manufacturer of extruded aluminum.

ANNEALING STAINLESS in a "natural" curve...*



COLD ROLLED
STRIP ANNEALING
FURNACE FOR 48" STRIP



ABOVE: SALT DESCALING BATH. BELOW: HOT ROLLED STRIP LINE.

*A Catenary curve, that is...

... the natural path assumed by the strip as it passes through the continuous Annealing Furnace. Complete exposure of the strip surface to heat and furnace atmosphere and the uniform stress throughout the strip assure maximum product uniformity. Support of the strip by special soft compressed asbestos disc rolls located outside the ends of the furnace assures an unmarked surface.

STAINLESS STEEL HEAT TREATING SPECIALISTS

The support of the strip on special rolls and the proper application of thermal conditions are but part of the engineering technique and heat treating experience that enter into the design of Drever Stainless Strip Annealing and Descaling Lines. Keeping pace with the ever growing demand for heat treatment of stainless steel in all its forms has been a particular project at Drever. This specialization is reflected in the number of successful installations, in many sizes, now in operation.

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The widening industrial and commercial use of stainless steel and the higher quality standards point up the need for producers to study the latest methods of heat treatment. Consult with our engineers regarding your requirements—or ask for Bulletin B-81. Drever Company, Bethayres, Pa. Phone: WIlson 7-3400.

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ENGINEERED TO YOUR PARTICULAR REQUIREMENTS

ENGINEERING AND MANUFACTURING FACILITIES AROUND THE WORLD THROUGH ASSOCIATES IN FRANCE, GREAT BRITAIN, GERMANY, ITALY, JAPAN AND INDIA

WAY OUT!— "In the early 1970s, a nuclear rocket vehicle will be able to make a trip to the moon, and shortly thereafter, a similar space machine should be able to carry people to Mars for about $2000 per passenger. Cargo costs to Jupiter for long term trips should run from 70 cents to $40 a pound." Thus spoke Robert F. Trapp, supervisor of the space propulsion section, Douglas Aircraft Co. Inc., Santa Monica, Calif., at an Atomic Industrial Forum. Biggest cost will be the first 1 million lb engine: About $1 billion.

AWAY WITH BUMP, SWAY— Power is employed in a hydraulic suspension system developed for government equipment. Westinghouse Electric Corp. envisions its use to greatly smooth automobile rides. It would compensate for road changes.

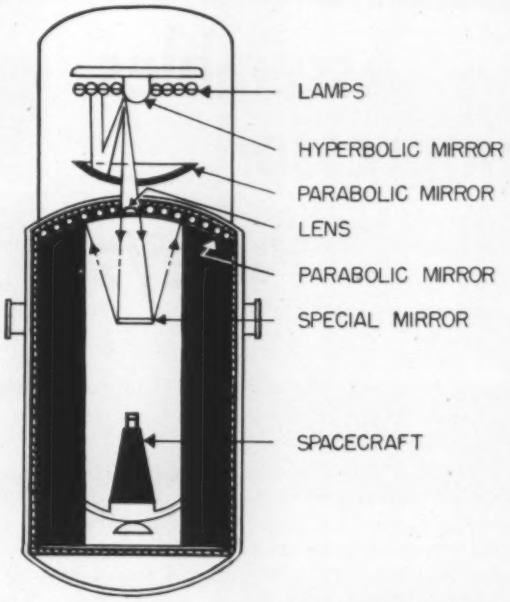
REFRACTORY PROGRESS— Based on previous studies, six promising alloys in the tungsten, tantalum, molybdenum, columbium system are going to be tested for high temperature strength and extrudability, says Crucible Steel Co. of America, Pittsburgh. The work will be conducted for the Air Force.

TITANIUM PROGRESS NOTE— The relatively new super-alpha titanium alloys are expected to become an important material in structures which operate below zero to perhaps 1000° F. The alloys are weldable and exhibit high creep strength in the range 700 to 1000° F.

PATTERNED WIRE—A new type of wire has a decorative surface design which can be specified by a buyer, states Pittsburgh Steel Co., Pittsburgh. Vines, stars, crescents, or a wide variety of characters are rolled into the wire at the mill.

SPRAYED METALS BEHAVE—Six years of testing has shown that aluminum alloys can be protected from exfoliation corrosion with sprayed coatings of almost pure aluminum or aluminum-zinc. (Some test samples had ½ in. gaps machined in the surface.) By comparison, a four coat paint system failed after about four years of exposure, claim V. E. Carter and Hector S. Campbell, British Nonferrous Research Association, London.

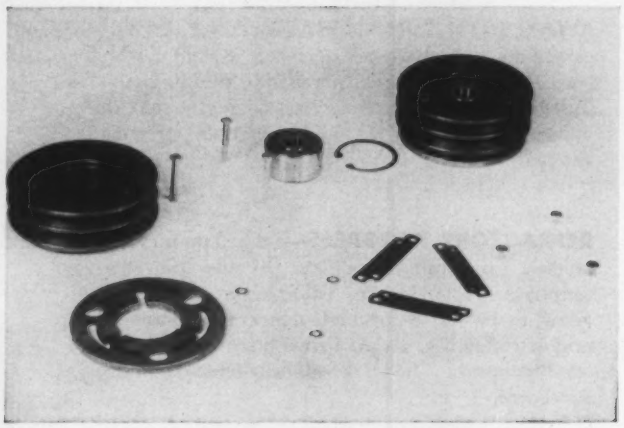
NEW GRAIN SIZE TEST—Measuring the aluminum content of steel is a better, less expensive way of measuring grain size than the standard McQuaid-Ehn test, says the British Iron & Steel Research Association (BISRA), London. The old standard test imposes unduly strict conditions for specifying grain size, says BISRA, if the steels are for ordinary engineering or heat treating applications.



ENVIRONMENTAL VACUUM CHAMBER duplicates the effects of the sun on a spacecraft during a journey to Venus or Mars. Light from Westinghouse mercury-xenon lamps is projected on the full sized test vehicle through a series of mirrors and lenses. Chamber walls don't emit heat or reflect energy from the spacecraft. The chamber is being installed at California Institute of Technology, Pasadena, Calif.

OLD METHOD: Four people working 8 hours on this line produced 875 pulley-plate assemblies for an auto air conditioner compressor

How Frigidaire Assembles Compressor Pulleys



Six reeds (lower, right) are assembled with rivets to armature plate (lower left) and the pulley. Roller bearing is secured during last operation with a snap ring

• A SWITCH from manual to semiautomatic building of pulley-plate assemblies for an auto air conditioner compressor cut costs 45 per cent at Frigidaire Div., Dayton, Ohio, General Motors Corp.

Labor and burden costs were 31.5 cents. The new line turns out the parts for 17.5 cents, a figure which will probably decline even more as production volume increases, says Frigidaire.

• Assembly is done on an automatic unit that's 25 ft long. Although the machine requires three operators, it can be changed easily to automatic operation. Output: 1800 pieces per shift. Formerly, four people turned out 875 in the same period.

Two slightly different pulley-plate units are made on the line. Each has an armature plate connected to a double grooved pulley by six flat metal reeds. (One end of each reed is attached to the armature plate, the other end to the pulley.) A roller bearing is inserted in the pulley bore.

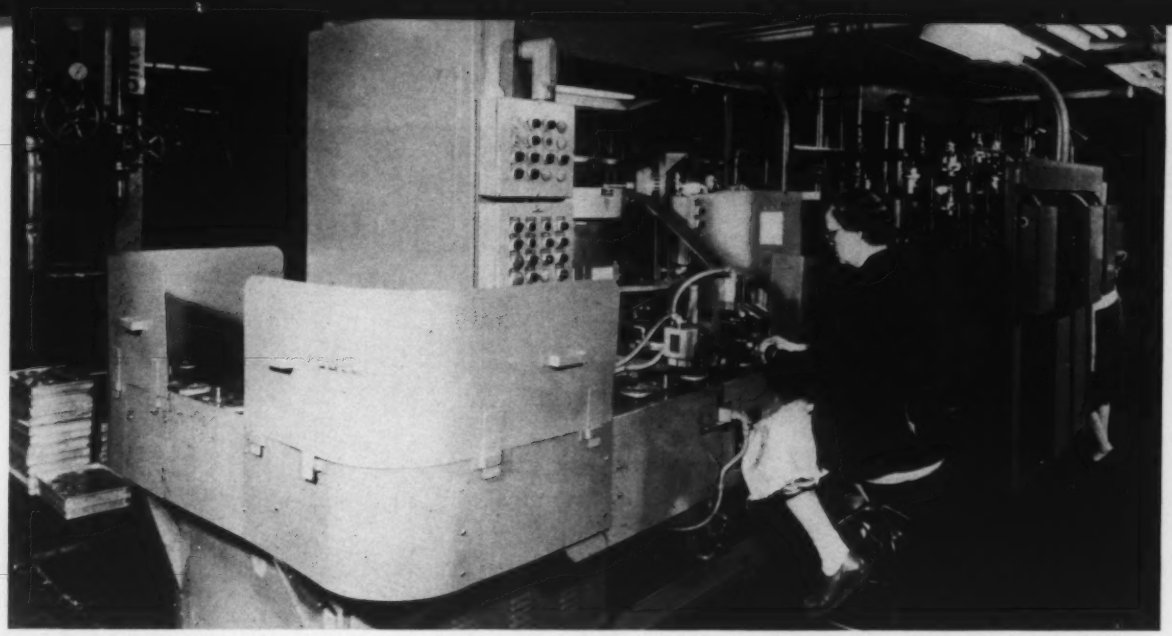
Most critical specification: No end play between rivets and holes at the ends of the reeds. As a result, rivets must be hot set in resistance welding machines.

Three manual operations were retained from the old manual assembly system, says Frigidaire, because automatic equipment to handle the heavier items is expensive. Acquisition of the larger automation pieces has been deferred until output needs increase.

All operations are completed on an oval setup which has 34 stations. Integral traveling fixtures carry the parts along the line.

Here is the sequence of operations: The armature plate is placed; then the rivets, washers, and reeds are put on three locating pins. Machines hot set the rivets through each reed hole.

Pulleys are placed manually over the armature plate; three more rivets are inserted and set to secure other ends of the reeds to the pulley plate. Finally, the roller bearing is in-



NEW METHOD: Three people (one shift) turn out 1800 parts a day. The line can be converted to completely automatic operation

In this closeup, you can see the seated operator beginning the sequence by loading six reeds after rivets and washers have been placed automatically by the new equipment

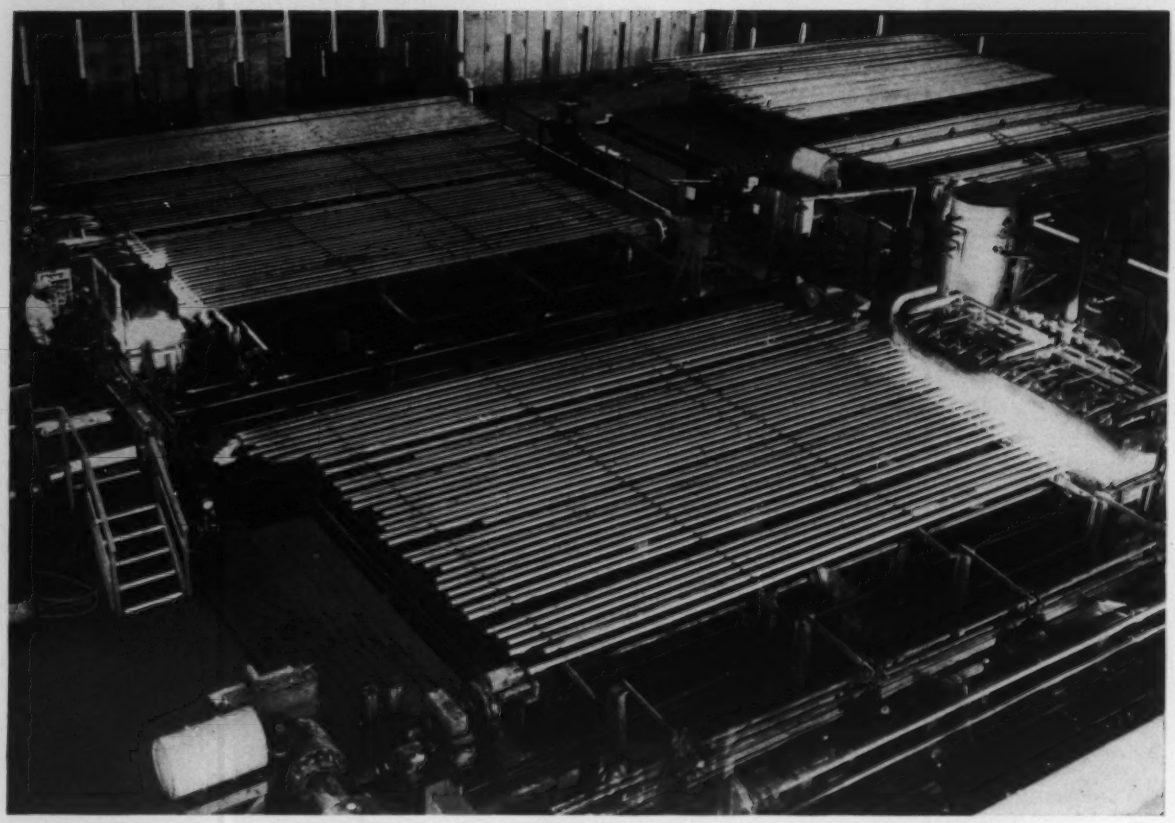
Following final hot setting operation, pulleys are ready for removal

serted and secured with a retaining ring snapped into the pulley bore. A final hot setting of the second group of three rivets completes the operation. (All rivets are stainless.)

Wide tolerances in pulley thickness change the level of the traveling fixtures, so some leeway is incorporated in the down stroke of the rivet drivers (there are nine). Ordinarly, such problems are surmounted by putting the fixture in a spring mount, so the roll set or anvil can deflect the amount of thickness change, but at Frigidaire, all the rivet setters on the line are spring mounted, so the machines rise upward during setting to provide compensation.

• Transfer of partly completed pulley plate units at one station presented a problem. Unset rivets had to be held during transfer.

Three formed washers were added by the assembly machine designers to hold the rivets which would otherwise fall out during transfer. Washers are dropped lightly over the locating pins onto interrupted staking anvils. Pneumatic rivet setting machines are adjusted, so that drivers insert the rivets and bottom them against the washers. Rivets, forced through, deform the washers against staking anvils. Washers then spring against the rivet shanks, holding them and the armature firmly during transfer.



Tube ends are readied for threading in one pass through a synchronized system of conveyors, slot type furnaces, automatic indexing tables, and double die upsetting machines

Benefits of Mechanization Shown by Upsetting System

• APPLICATION of the system concept helped to double production in a hot upsetting operation in the seamless tube finishing department at the Campbell (Ohio) works of Youngstown Sheet & Tube Co.

Co-ordination of material handling, heating, and upsetting equipment insures smooth product flow and uniform quality in the production of externally upset, oil country tubing. The operation: Upsetting of tube ends prior to threading.

• Faster processing makes it possible for finishing floor facilities to handle increased output from the seamless mills.

A mill modernization that included a new, stretch reducing mill boosted production of 2⅜ to 3½ in. OD tubing from about 1600 pieces to 4000 pieces per day. Older upsetting facilities (which included one furnace and one, single die upsetting machine) were considered inadequate.

The answer: A synchronized system of conveyors, two slot type furnaces to heat tube ends, two automatic indexing tables, and two, double die upsetting machines.

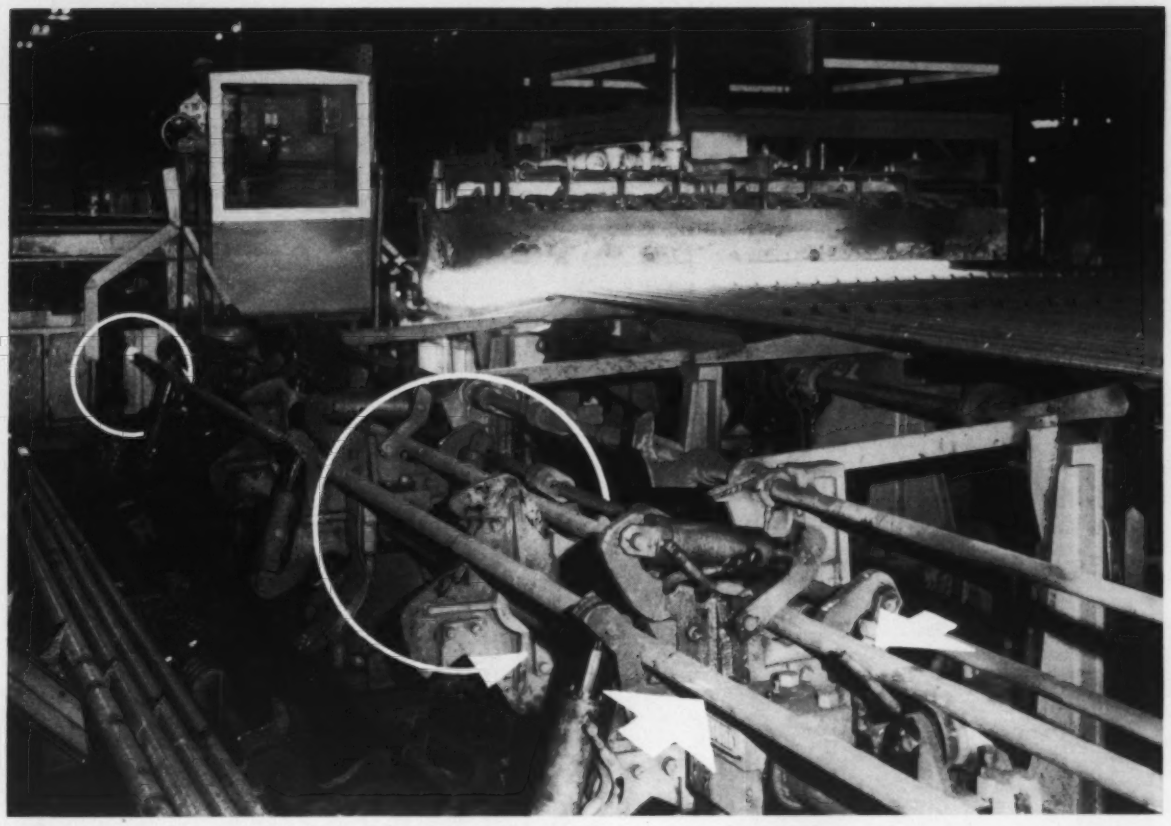
• Mechanization provides smoother product flow, and uniform heating makes product characteristics more predictable.

A chain conveyor system, supplied by Lombard Corp., Youngstown, carries tubing through two complete upsetting systems, which process tube ends consecutively. That makes end-for-end re-orientation of the tubing unnecessary and provides continuous flow from charging of raw tube sections to discharge of the upset product. The tubing flows through the upsetting stations at 250 to 300 pieces per hour.

Tubing is moved against a stop gage by magnetic rolls, which provides for accurate end positioning in a slot type, gas fired furnace (supplied by Selas Corp. of America, Dresher, Pa.).

Ends are heated as tubing is rolled through the furnace. System synchronization, controlled by rheostats, insures the proper upsetting temperature when tubing is delivered to the Hill Acme upsetting machines. The temperature is usually about 2050° F, but it is varied for different grades of steel.

• Automatic indexing tables insure



Indexing table orients heated tube ends in upsetting die cavities. During each table cycle, one tube end is given its final shape, while the other is making its first pass

accurate positioning of workpieces in the upsetting dies.

Rotary, indexing tables, supplied by Lombard and modified by Youngstown Sheet & Tube personnel, provide proper orientation of tube ends in the upsetting dies. Longitudinal travel of the tables moves tubing to and from the upsetting machines. A slight lateral motion facilitates the introduction of tube ends into stationary die halves. Rotary indexing is done electrically, but a hydraulic power system is provided for longitudinal travel. The two way, variable delivery pump and double acting hydraulic cylinder were supplied by Oilgear Co., Milwaukee.

Tubing from the furnace is delivered to the upper station on the indexing table, when it is in the retracted position. Magnetic rolls and a stop gage insure accurate orientation, and air actuated clamps close on the tubing. The table moves the tubing into the upper die cavity in the upsetting machine; dies and clamps are closed; and the upset plunger is forced into the tube to gather metal at the end. When the dies and clamps are opened, the table is retracted and rotated to accept another tube section and position the partially upset section for its second pass.

The table again moves toward the dies; one tube end is shaped while another is making its first pass.

Tubing is discharged from the retracted table to a chain conveyor after the two passes are completed. It is then taken to the second furnace, indexing table, and upsetting machine for processing of the opposite end. Each tube section, as it comes from the stretch reducing mill, is cut into four pieces before upsetting. The stock gage is adjusted slightly to compensate for heavier stock present in the extreme ends of the original, multiple lengths of tubing.

● **Two strike upsetting produces a readily threadable surface; improved design extends die life.**

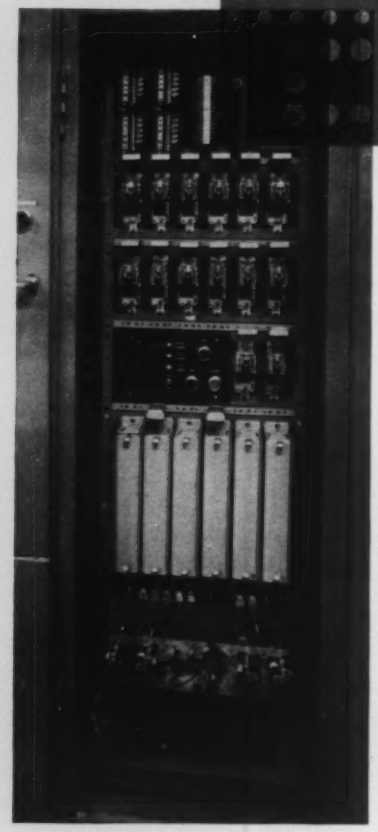
Forming in two passes—gathering of metal on the first pass and shaping it on the second, without reheating—produces a surface that can be threaded easily, without turning. In the previous setup, which involved two heating and upsetting cycles on each tube end, the upsetting dies left "fins" on the tubing. The fins had to be removed with grinding machines.

Longer die life and less downtime are insured by fixed cavity die inserts, which are case hardened by nitriding and bolted into the die body. The inserts wear five times as long as those they replaced.

Previously, heavier inserts, made of hot work die steel, were clamped in place in the die bodies. Constant "working" of inserts caused them to wear rapidly. Wear in the die bodies made it necessary to use a greater number of shims each time inserts were renewed and shortened service life of the bodies.

Paper Tape Controls Heat Treating Line

Precision in hardening cycles, rather than increased production, led to automation of installation in New Zealand that hardens alloy and high speed steels



This console contains the equipment for cycle control. Temperature controls are mounted separately

• **NEED for close control has led to installation of a tape controlled, high speed steel hardening line for custom heating a variety of parts at the Dominion Physical Laboratory of the New Zealand Department of Scientific & Industrial Research, Gracefield, N. Z.**

There's a growing recognition that there are two reasons to automate an operation: 1. High production (more common). 2. The need for precise duplication of a cycle even if the production level is low.

In the New Zealand case, the automated heat treatment line has increased production five times and has made widely varying cycles possible.

Twelve months were spent in the development of the system by a laboratory group that is available to New Zealand industry for consultation on automation.

The heat treating cycle is conventional, comprising two preheats, a high heat, air or salt quench, and double tempering.

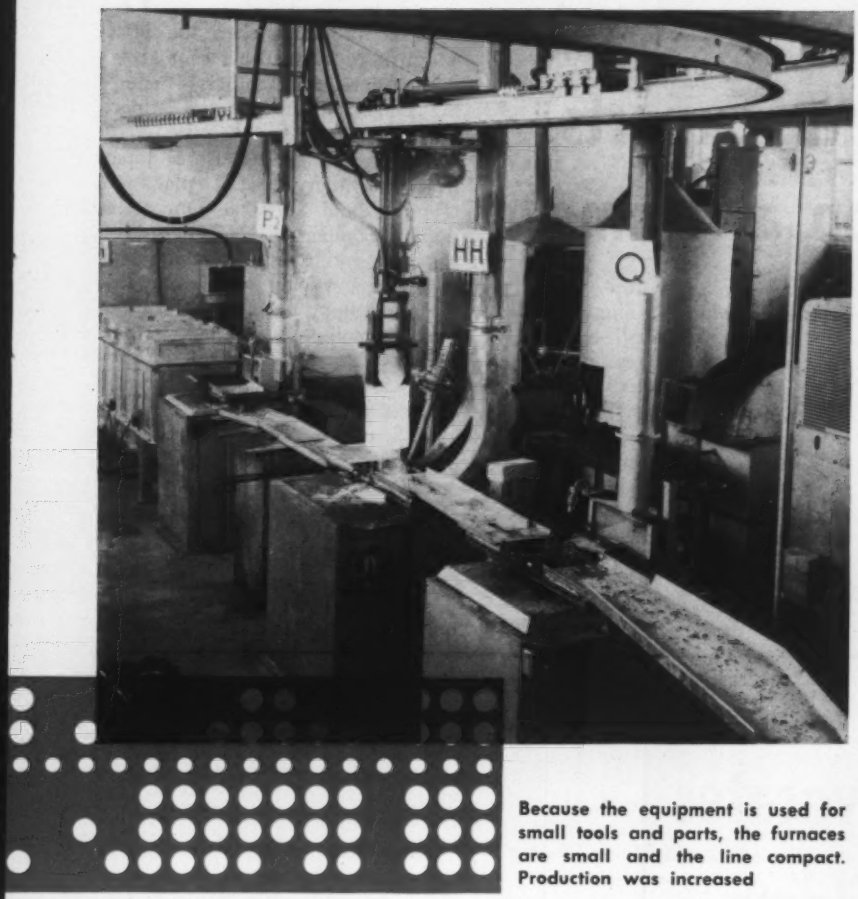
• **Four furnaces are involved in the heat treatment, and the work is carried in standardized baskets.**

The first preheat is an air furnace, electrically heated. It will hold 15 baskets, preheating them to about 800° F. The 16 kw unit is 6 ft long.

The second preheat is a salt bath that operates at 1575° F, has positions to hold three baskets of work. The high heat bath, holding one basket at a time, will run at a temperature ranging from 1950 to 2375° F.

The quench bath, which is also used for tempering, will hold three work baskets and operates at 1050° F when used for quenching. For tempering, the temperatures may be adjusted for the desired results.

Baskets are made of $\frac{1}{8}$ in. thick mild steel with a $\frac{1}{2}$ in. detachable base. Along the longer sides of the baskets, two bars, each 1 x 5/16 x $10\frac{1}{2}$ in., are used to support the basket in the baths and to attach it to the trolley for transfer.



Because the equipment is used for small tools and parts, the furnaces are small and the line compact. Production was increased

Beyond the quench furnace is an air blast cooling station.

Rails above the air furnace and salt baths support the baskets when they are not in motion. Additional rails at either end of the line hold the baskets when not in use.

• Trolleys carrying the baskets through the heat treating cycle run on an overhead track consisting of a main guide rail and an outrigger support channel.

Roller actuated switches and V-guides on the main support rail position the trolley, and corresponding V-guides on the furnace rails insure that the baskets occupy their proper locations in the heating units.

The trolley is supported from the frame by two pairs of wheels. Drive is provided by a ½ hp electric motor; a reduction drive moves the trolley at about 1 ft per second. The brake is electromagnetic.

Pneumatic cylinders for raising and lowering the baskets are on a spring loaded frame below the trolley. Fingers from the two piston rods hold the baskets, with spring loaded bars to clamp the basket in position. Another cylinder on top of the floating frame corrects for any longitudinal misalignment.

Power to actuate the trolley and the cylinders (60 psi shop air supply) is delivered by means of flexible hose and cable loops.

• The tape control system uses a five channel punched paper tape, prepared by a console type punch.

Switches and dials on the console are used to set up the cycles for heat treatment as specified. Two way switches select air cooling or salt bath quenching, and cycles for high speed steels or ordinary tool steels. Dials or control knobs determine the hardening temperature, time in the high heat bath, and the first and second tempering temperature. Signal lights show when the information has been entered.

An interlock prevents punching of the tape until all variables have been entered on the console, and a repeat knob is used if the temperatures for succeeding baskets are the same as the first. A complete tape for 15 baskets is about 40 in. long.

Tapes pass through the reader three times for the complete cycle, once for hardening and once for each tempering cycle. Temperatures, read from the tape, are set into the control instruments by small motors that adjust the set points of the instruments. The operating sequence adjusts for the extra time required for the furnace to come to proper temperature.

• While the loaded baskets are coming to the preheat temperature, the tape is inserted in the reader. When the baskets have reached preheat temperature, three are placed in the salt preheat and the tape takes over.

After 12½ minutes in the preheat bath, the first basket is transferred to the high heat. While it is heating, the trolley transfers another basket to the preheat salt. Next, the basket is removed from the high heat to the quench, the vacant position in the high heat is filled from the salt preheat, and another basket transferred from the air furnace to the first salt pot. A similar cycle is performed when the basket is removed from the quench.

If variations in the high heat time would cause interruption in the flow, a comparison circuit delays the entry of another basket into the high heat for an appropriate time. The extra time in the preheat presents no difficulties. In case of a temperature change, the high heat charge is withheld until the required temperature is reached.

A "tailing out" procedure avoids recycle of the trolley to the air furnace or to the preheat bath if those are empty.

For tempering cycles, which are carried out in groups of three baskets, the entire lot of 15 baskets is carried back to the preheat air furnace.

• Safety systems and provision for special cycles are incorporated in the equipment.

Safety precautions are provided for such contingencies as power failure, drop in air pressure, thermocouple or radiation pyrometer failure. The basket grips will hold the baskets without power.

Japan Encourages Exports, Seeks Protection at Home

• JAPANESE officials are promoting the export of heavy capital equipment. At the same time, they are encouraging Japanese industry to buy from domestic builders.

The Ministry of International Trade & Industry (MITI) has decided to ask for 42.4 billion yen (about $115 million) in the 1962 budget to finance a deferred payment system for the export of heavy electrical machinery. The idea is to give Japanese electrical equipment makers the financial resources needed to offer better credit terms to their foreign customers.

• "Buy Japan" program takes shape.

MITI wants a "Buy Japanese Machinery" law. The proposal: Companies that buy machinery with government financing and investment should be compelled to purchase domestic products when the price is not more than 10 per cent above that of foreign machinery—including freight, insurance, and import duty.

To promote greater use of Japanese machinery, MITI plans to spend around $770,000. One technique: Comparing the quality of Japanese and foreign machinery.

Japanese machine tool producers are establishing a Machine Tool Export Promotion Association, with a budget of about $865,000, to promote exports. Included will be these programs:

1. Setting up a system to rent Japanese machine tools to foreign manufacturers.
2. Doing market research.
3. Establishing distributors, with service facilities, in foreign lands.

Gearmaker Advocates Machine Rebuilding

• MACHINE REBUILDING can and should be an important part of quality control, says the management at Cloyes Gear & Products Co., Cleveland.

Rebuilding isn't a substitute for buying new equipment at Cloyes, but the company has had marked success using the rebuilding approach to keep its machines performing like new ones.

The rule it uses: An old machine tool is rebuilt if the job can be done by a reputable rebuilder for not more than 50 per cent of the cost of a new machine. If the rebuilding cost runs more, the old machine is replaced.

In addition, Cloyes believes many old machines ought to be replaced, regardless of the rebuilding cost. Examples: Belt driven machines and those with plain bearings, large exposed gears, or a minimum of automatic controls.

• To hold the required accuracy on workpieces (often to 0.0005 in.), the company runs a program of periodic machine checks.

A complete history is kept of each machine, showing the production load it carries, the nature and time of any minor repairs, and any accidental damage that could affect accuracy. Overhauls are also recorded.

After checking the records, the company runs a series of tests to see if the machine needs new parts and whether the beds or ways need attention.

Since spindle bearings are subjected to loads full time, they are high on the priority list of items to be checked. Hand turning the spindle won't do the job, say production men at Cloyes. They check for noise while the machine is running—sometimes use a stethoscope to catch hidden sounds. (They warn against putting the plugs in your ears since gear chatter can be ear splitting.)

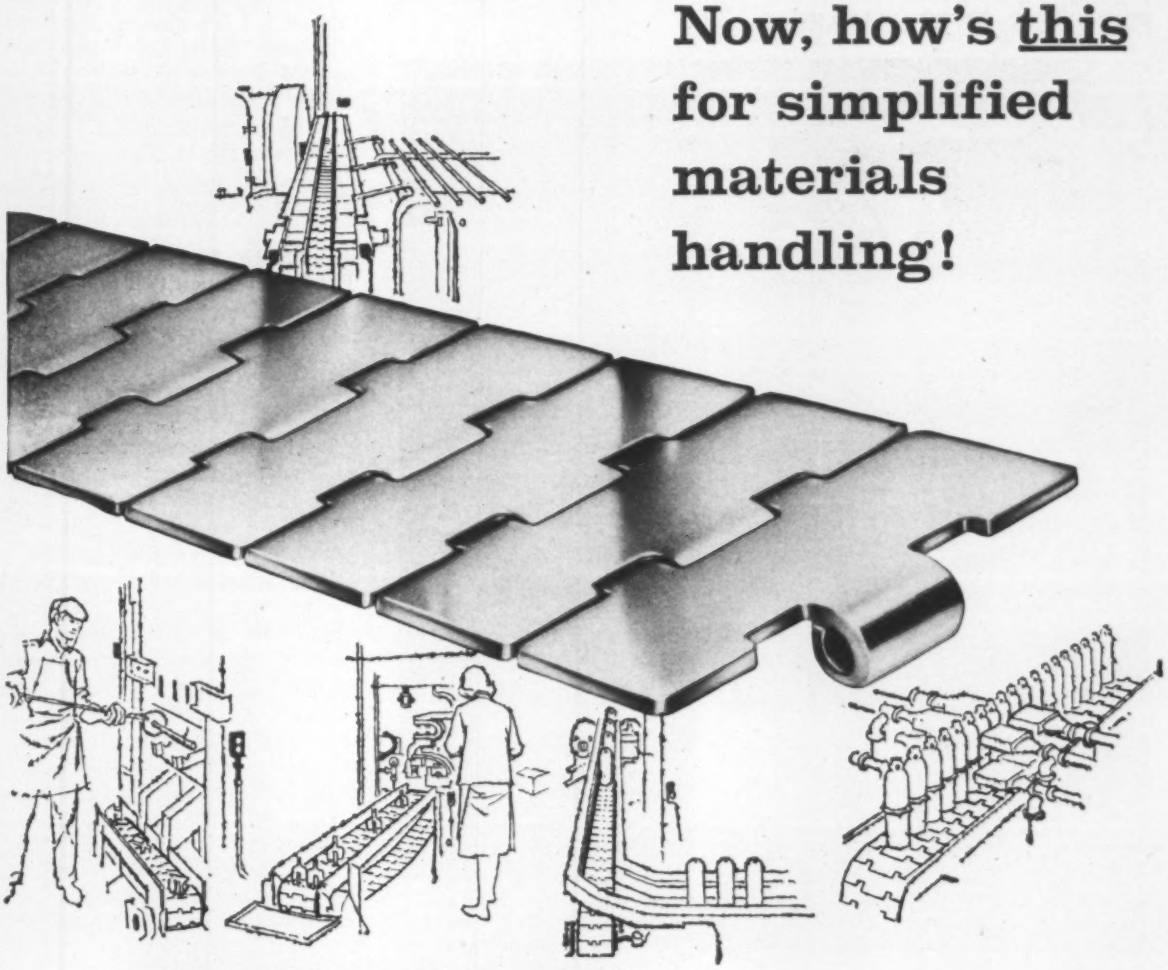
Also, the company recommends running a machine at all speeds and feeds, one gear train at a time. All parts should be checked for such things as wear, play, and backlash. Each gear should also be checked visually.

One of the easiest ways to check lathes: Turn a cylinder on them. A length of bar stock is put between centers or in the chuck and a roughing cut and two finishing cuts are taken. If the work is tapered, the machine bed is twisted or misaligned with the spindle. A twisting effect shows settling or irregular wear along the bed, and if the piece is larger at the center than it is at the ends, the bed is worn.

With such tests, says the company, you can spot most of the major parts that need rebuilding. (Most rebuilders will quote prices for labor and new parts before rebuilding begins.)

Cloyes figures the rebuilding checks and followthrough are important ingredients in quality control. Investments in them are essential to keeping product quality high.

Now, how's this for simplified materials handling!



REX TableTop® Chain

If you are handling anything from small, fragile parts to hot abrasive forgings, Rex TableTop may very well be just the thing for you, too. It's simple; it's versatile; it's economical!

It quickly became the leading "tops" chain in the food, bottling and canning industries. Now Rex TableTop is bringing new, cost-cutting service to a wide variety of industrial applications.

If you want long, trouble-free service life without lubrication or if conditions are abrasive, hot, cold, wet or corrosive, Rex TableTop is ideal—for Rex TableTop is available in a variety of materials: carbon steel, stainless steel, or new Delrin (a new acetal resin by DuPont), and in five widths from 3¼" to 7½".

REX TABLETOP:—provides a flat, continuous plane carrying surface. Rex close-hinge design practically eliminates the gap between plates—smallest, tallest parts ride tip-free, snag-free—provides top economy! Simple, 2-piece construction—platform link and pin—means low initial cost, easy installation and lowest possible maintenance expense.

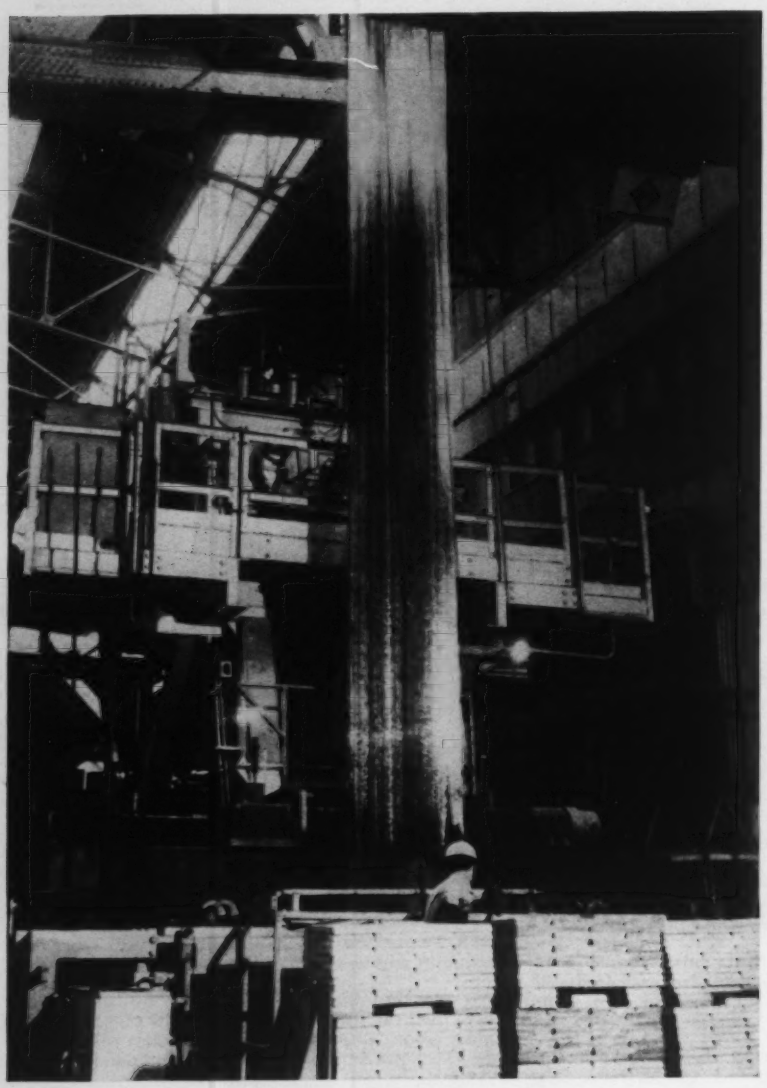
A TYPE FOR EVERY REQUIREMENT

REX TABLETOP OF CARBON STEEL—heat-treated for maximum strength and longest wear life—handles hot, abrasive forgings and heavy parts or boxes easily.

REX TABLETOP OF STAINLESS STEEL—provides strength and wear life of steel, yet resists corrosion.

REX TABLETOP OF DELRIN—stays strong, wet or dry; requires no lubrication; resists corrosion from most acids, alkalies or brine solutions; resists abrasion, will not scratch or mar the most delicate items.

For complete information on all Rex TableTop Chains, write CHAIN Belt Company, 4660 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: Rex Chainbelt (Canada) Ltd., Toronto and Montreal.



New facility features up-to-date coating equipment

Japanese Galvanizing Line Producing for Export

A JAPANESE steelmaker is getting ready to market galvanized, cold rolled coils at internationally competitive prices. Export of mass produced Leonite is scheduled to begin late this year.

The material is being produced on a new line at the Mizue Works of Nippon Kokan K. K. (Japan Steel & Tube Corp.)

• **Aim for World Markets** — The main markets are expected to be in Southeast Asia (including India and Pakistan), Latin America, and the Near and Middle East. But marketing will not be restricted to given areas. The quality of the coils will make them marketable in Western Europe and the U. S., says Yasujiro Yasuda, director of the company's sales department.

• **Sendzimir Process Employed** — The new facility is said to make use of the most modern methods of continuous galvanizing. The Sendzimir process is used under terms of a technical aid agreement with Armco Steel Corp., Middletown, Ohio.

Pickling and fluxing are eliminated. Unannealed coils are oxidized, reduced, normalized or annealed, and cooled in independently controlled heating and cooling zones.

Elimination of the fluxing operation makes it possible to add aluminum to the zinc pot. The arrangement is said to make for a tighter coating with good formability.

The line's extremely long, heat treating furnace makes it possible to produce galvanized sheets to customer specifications. The sheets are said to have a more attractive surface and more uniform quality than those previously produced at the works. Chemical treatment is said to prevent white rust in storage.

Two New Mills Erected For English Steel Company

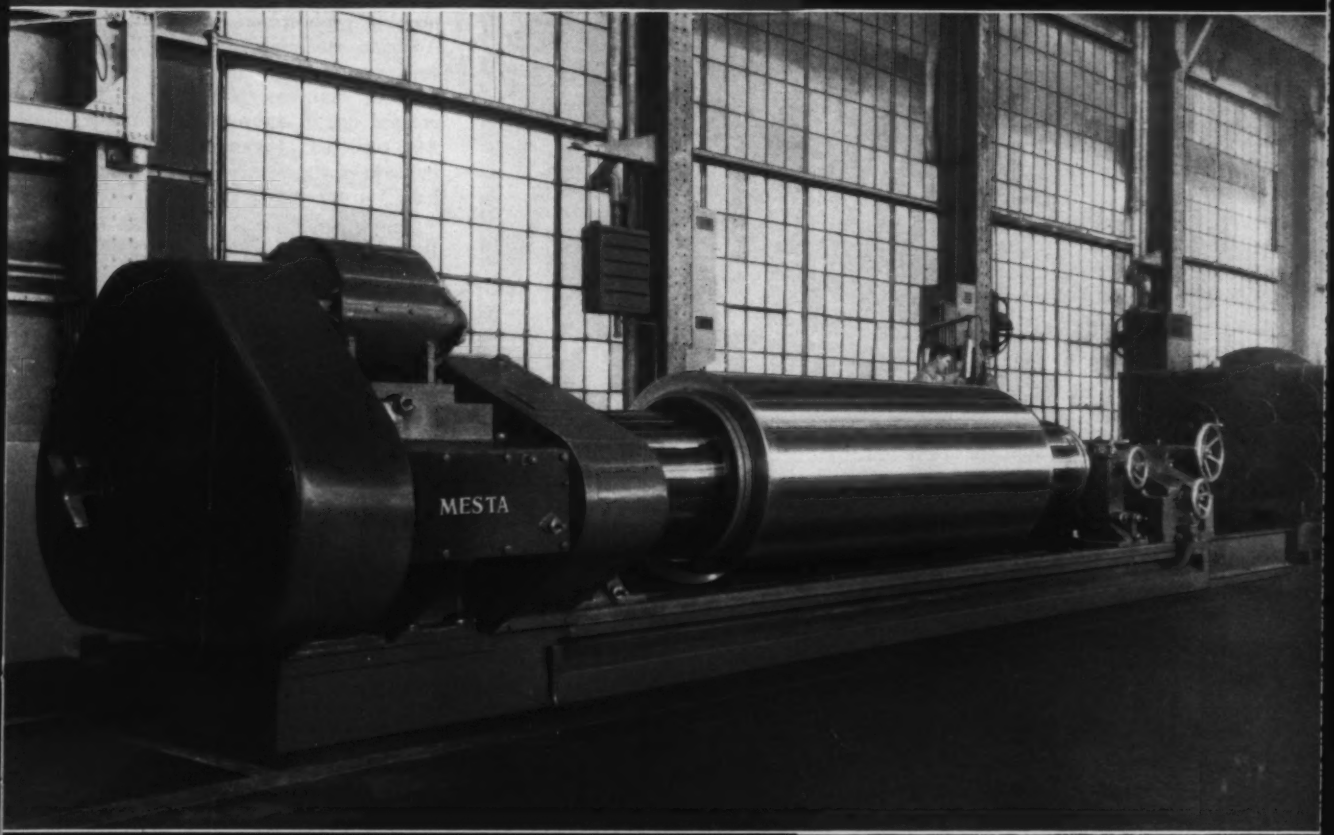
TWO CONTINUOUS mills, one for the production of billets and the other for rolling rods, are scheduled to go into production in 1962 at Appleby-Frodingham Steel Co. Ltd., Scunthorpe, England. Mills and auxiliary equipment are being built by Schloemann A. G., Dusseldorf, West Germany.

The four stand billet mill, with an advance, two high reversing stand, will be used mainly for preparation of material for the rod mill. It will also be used for the manufacture of semifinished products for direct sale.

The rod mill is designed to handle diameters of 7/32 to 1⅛ in. Capacity: 30,000 tons per month. It features four strand rolling in the roughing train and two strand operation in the intermediate and finishing trains.

Heavy Duty ROLL GRINDERS

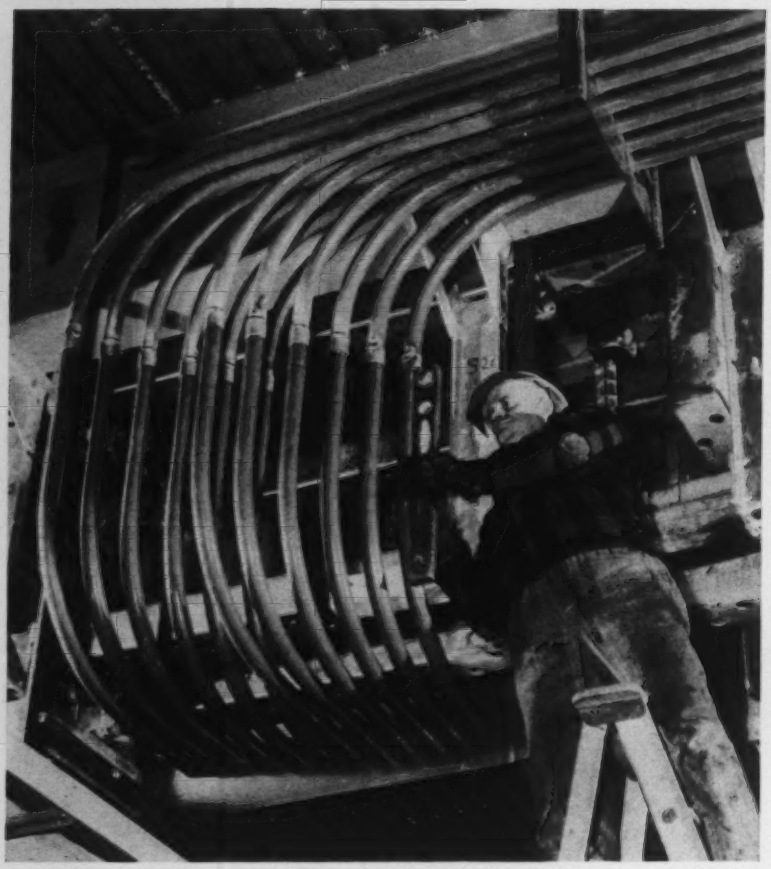
Designed and Built by MESTA



Mesta Heavy Duty Traveling Wheel Type Roll Grinder
Finishing a 59" x 154" Mesta Backing-Up Roll

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY · PITTSBURGH, PA.



Polyvinyl Coating Protects, Colors Strip Mill Conduit

• THREE KINDS of conduit problems — maintenance, safety, and identification—have been eliminated in a new, 80 in., hot strip mill at Great Lakes Steel Corp., Detroit, a subsidiary of National Steel Corp. Solution: A bright red, polyvinyl coating.

The corrosion resistant material covers both the inside and outside of electrical conduit. Eliminated are rust, postinstallation painting problems, and safety hazards to personnel tending to the conduit in 50 ft bays.

• Conduit in sizes from ¾ to 4 in. in the plant adds up to 1.5 million lb.

Included in the installation is a motorroom 70 ft wide and 1176 ft long. Electrical equipment includes drive motors, gear sets, motor-generator sets, switchgear, and control equipment.

Typical conduit runs are three deep and 14 wide, including two deep, 12 wide, curved runs. Elimination of the usual maintenance problems makes the grouping possible.

National Electric Div., H. K. Porter Company Inc., Pittsburgh, makes the tubing. The process is similar to that for making Sherarduct. After pickling, rigid steel conduit is galvanized by the Sherardizing process in which zinc is alloyed to the conduit walls and threaded ends. The pieces of conduit are then immersed in a bath of MVC-1 polyvinyl. The finish is baked hard in drying ovens.

Progress Reported on Basic Oxygen Alloy Steel

PROGRESS in the production of alloy steels by the L-D process was reported by Austrian, German, and Japanese metallurgists at a meeting of L-D steel producers in Vienna.

French and Benelux operators described the use of lime powders in processing phosphoric pig iron. And Austrian steelmakers discussed developmental work on the production of stainless grades and increased use of scrap in the process. Also reported: Plans for further expansion of the process in the Americas, Europe, and Japan.

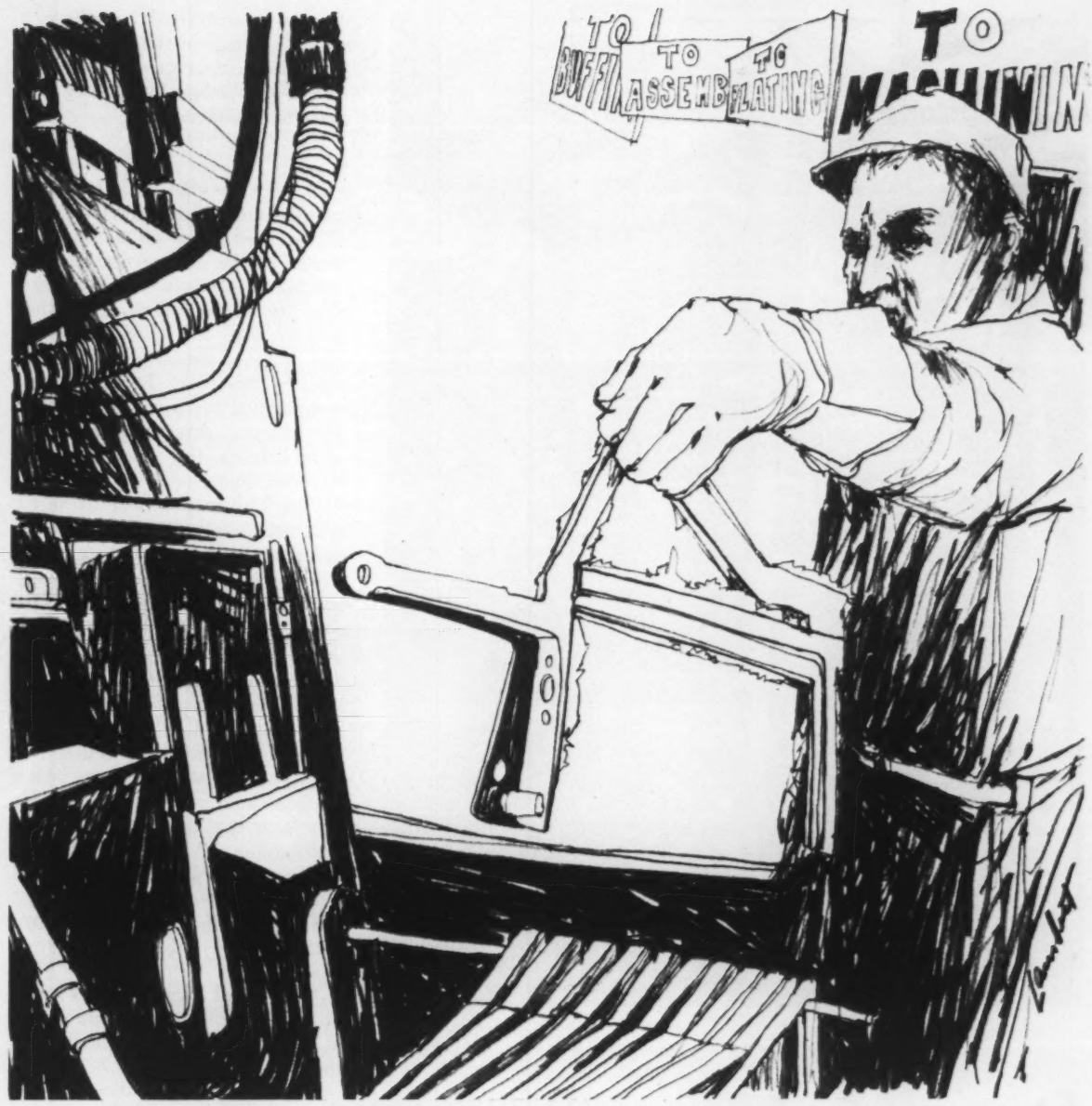
The meeting was sponsored by Brassert Oxygen Technik A. G., Zurich, Switzerland, the parent licensing organization. Licensor for the process in the U. S. is Kaiser Engineers Div., Henry J. Kaiser Co., Oakland, Calif.

Fine Grain Ups Quality in Beryllium Copper Castings

BETTER CONTROL of grain size in beryllium copper castings is said to be possible with alloys developed by Beryllium Corp., Reading, Pa. The fine grained alloys are reported to have improved mechanical properties, better surfaces after machining, and greater grain uniformity in thick and thin section. The alloys will not require special additives or handling.

Japanese Plate Output Up

A NEW PLATE mill has been put into operation at Kawasaki Steel Corp., Chiba, Japan. Finishing line equipment for the mill, including roller tables, cooling beds, plate turnover, hot levelers, rotary shears, cropping and dividing shears, and material handling equipment, were engineered by Schloemann A. G., Dusseldorf, West Germany. Part of the equipment was manufactured in Germany, the rest in Japan.



THE PLANT IS OURS... THE COMPLETE POST-CASTING FACILITIES ARE YOURS

We're die casters, of course. Biggest, best-equipped, most service-minded in the business. More facilities, more highly experienced personnel, the widest range of die-castable alloys, our own fleet of trucks to give overnight rush service when needed. When you want a part die cast, you can't do better than Doehler-Jarvis. *But that's not all!* If you're a cost-conscious purchasing agent or production man, consider the other advantages of using Doehler-Jarvis. We'll not only die cast the part you want, but drill it, tap it, ream it, buff it, degrease it, finish it (plate it, paint it, anodize it, or whatever), sub-assemble it, inspect it, package it and ship it. To you or direct to your distributors. The plant is ours, but the production line—from blueprint to final packaging—is yours. Chances are we can save you money every step of the way. Ask Doehler-Jarvis to quote on your very next job. Call or write the Doehler-Jarvis office or plant nearest you.

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DIVISION OF NATIONAL LEAD COMPANY

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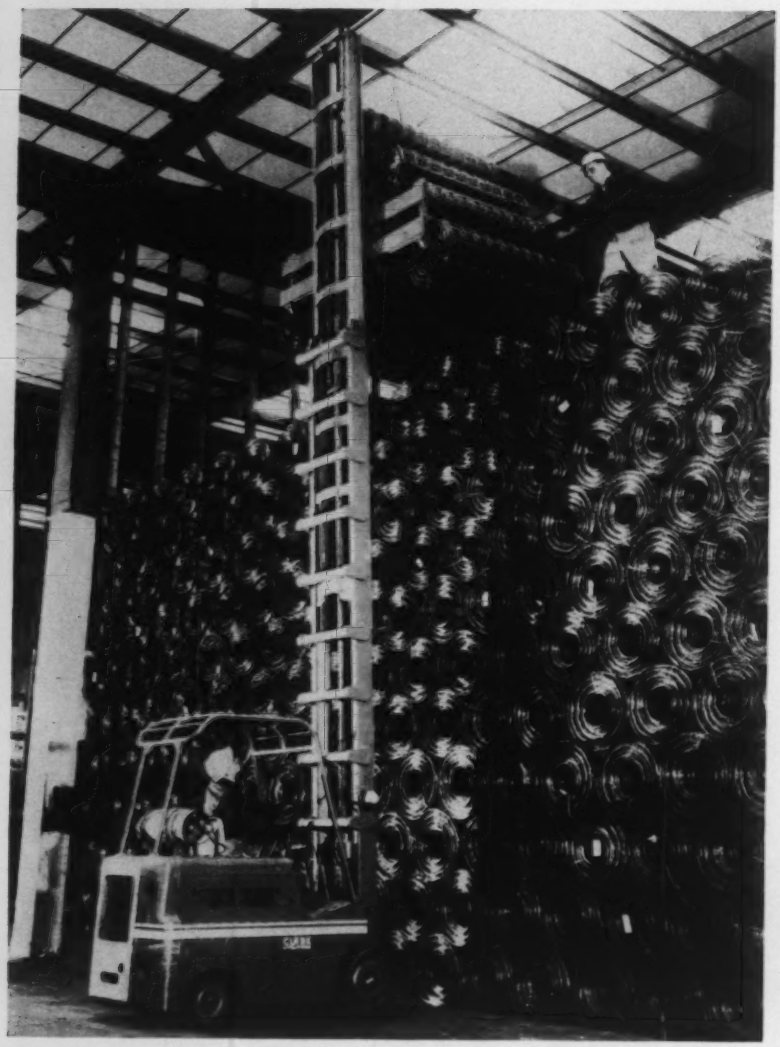


Storage Techniques Break Production Bottlenecks

• STORAGE techniques involving a high lift fork truck have eliminated knotty work scheduling and production problems at Parrish-Alford Fence & Machine Co. Inc., Rock Falls, Ill. (It's a subsidiary of Northwestern Steel & Wire Co., Sterling, Ill.) Rush periods, overtime, and the hiring of temporary employees have been eliminated.

The plant can now work three shifts per day, five days a week to build up inventories for anticipated seasonal orders. Formerly, it was operated six and seven days a week during rush periods due to lack of storage space for finished woven wire products.

• The Clark Utilitruc tiers 2000 lb loads as high as 31 ft 3 in.

It operates in a 32 ft warehouse that was constructed to relieve a critical shortage in storage space for finished products — galvanized, welded wire fabric for fencing and concrete reinforcement.

• Safety features permit use of the truck as a personnel lift for plant maintenance and construction.

The truck was of considerable benefit in the construction of Parrish-Alford's warehouse. Painters, pipe fitters, electricians, and other workers were able to do overhead jobs from a special platform elevated by the truck. In many cases, it eliminated the need for scaffolds. The company says it was especially useful during the erection of an overhead crane.

The truck is stabilized by using solid tires, a nonpivoting steer axle, and a mechanical safety lock which prevents back tilting. A hydraulic accumulator on the upright cushions shocks while loads are being moved.

• Rolls of reinforcing wire are loaded onto carts as they come off the production line.

About 40 rolls of wire can be put on a cart. The carts have heavy channel iron frames supported by wheels at one end and metal legs at the other. A modified lift truck with a towing pin on the fork carriage lifts the carts (on the leg end) and tows them to the warehouse.

• The special high lift truck picks up four or five rolls of wire on 48 in. long block forks which fit into the core of the rolls.

Other rolls are then loaded pyramid fashion. Small rolls are stacked in a 5-4-3-2 pattern to form a unit load of 14 rolls. Larger rolls are stacked in a 4-3-2-1 pattern. When the load is elevated, the top layers are rolled off by a man on top of the pile. Forks are withdrawn from the bottom layer of rolls, and the storage pile is leveled off.

The truck also handles palletized loads of welded wire fencing. Pallets are taken to the warehouse by lift trucks equipped with conventional forks. They are stacked three high.

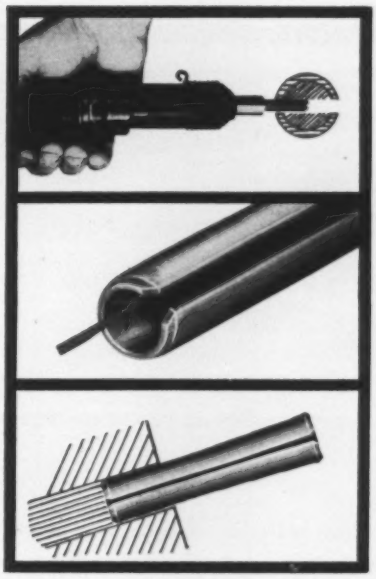
The truck tiers two, 54 in. square pallets. It will also be used to lift pallets to a balcony the company plans to add above two ground level rail tracks in the warehouse.

Rollpin won't mushroom or telescope

There are no installation or removal problems with Rollpins. Because of their column strength they can be readily driven with a hammer, removed with a punch without bending or collapsing. Of course production line tooling such as an arbor press, a pneumatic hammer . . . even a hand riveter . . . is ideal for Rollpin insertion.

Rollpin won't damage or enlarge hole

With smoothly chamfered ends providing an easy lead-in, Rollpin is compressed into complete conformity with the shape of the hole. The exclusive, v-shaped, coped corner design eliminates possibility of damage to the hole walls. They prevent any possible scoring action as the pin is driven and insures uniform insertion and removal characteristics. The benefit to you: the same pin can be reused in the same hole.

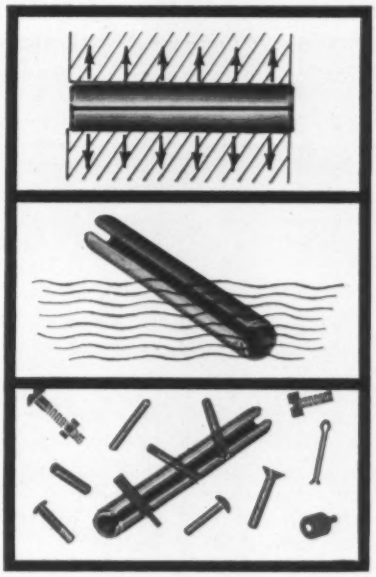


ONLY ROLLPIN OVERCOMES ALL THESE FASTENING PROBLEMS!

Rollpin exerts EVEN pressure

In some fasteners, only a portion of the fastener shaft does the actual holding. Rollpin, however, exerts a uniform pressure around the entire inside surface of the hole—giving you maximum holding power and superior resistance to vibration.

Split tubular construction assures uniformity of heat treatment that is difficult to obtain with spiral types of pins; there is an even plating "throw" inside the pin as well as outside for superior corrosion protection.



ONE TYPE of Rollpin does EVERY TYPE of job

Versatile Rollpins will replace at least 12 different types of fasteners. Every Rollpin can be hopper-fed, can be installed with a single operation. They are available, from stock, in a wide range of lengths and in diameters from 1/16" to 1/2". Manufactured from carbon or corrosion resistant steels and beryllium copper.

ROLLPIN®

ELASTIC STOP NUT CORPORATION OF AMERICA

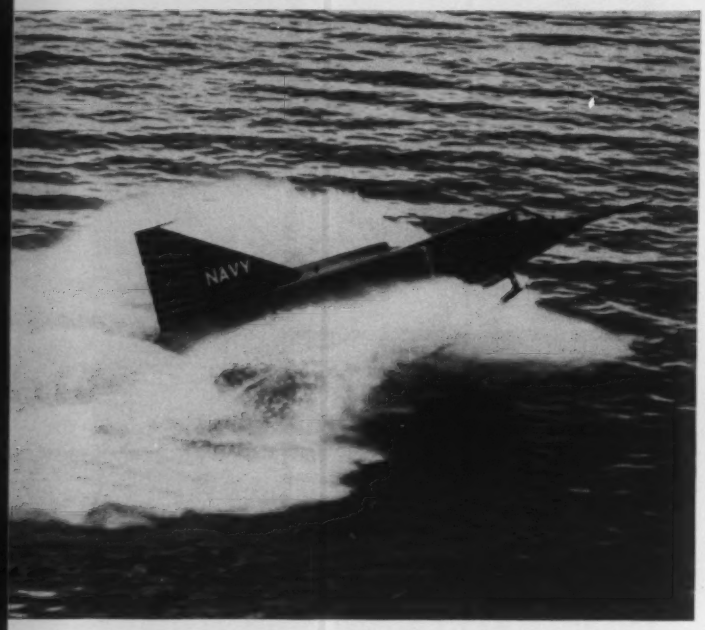
WHERE CAN YOU USE THIS VERSATILE FASTENER? MAIL COUPON FOR SAMPLES:

Dept. R59-1160, Elastic Stop Nut Corporation of America
2330 Vauxhall Road
Union, New Jersey

☐ Please send me ROLLPIN samples
☐ Please send me ROLLPIN bulletin

Name_____
Title_____
Firm_____
Street_____
City_____ Zone___ State_____

For marine exposure, combining toughness with corrosion resistance . . .



Vacuum Cadmium Plating Avoids Hydrogen

• HYDROGEN embrittlement can be controlled by several methods, but one of the most straightforward is to avoid hydrogen pickup in the first place. That's the basis of the vacuum deposition method.

Use of high vacuum equipment by Anadite Inc., South Gate, Calif., permits controlled deposition of cadmium on high strength steels for aircraft service. The coatings can be controlled within the usual range of 0.0003 to 0.0005 in., or heavier, and meet military specifications for corrosion resistance and adherence. The coating is reported to be uniform, and the process provides good throwing power. Although the cadmium is vaporized onto the parts, they remain close to room temperature throughout the process.

The vapor deposited coatings are not as bright as those applied by electroplating.

A similar process has been used for thinner films of metals, on such substrates as plastics. Aluminum has been used to apply a film with high reflectivity. For the heavier coatings needed to resist corrosion, cadmium has proved to be more suitable under the commercial conditions at the Anadite plant.

• A high vacuum is required for the process. Also needed: A heated crucible for the cadmium.

The vacuum chamber has roughing (mechanical) pumps to drop the pressure to about 0.5 micron. Diffusion pumps further reduce the pressure to the 10^{-7} micron range (0.0000001 micron).

At that high vacuum, the heated cadmium vaporizes. Traveling in straight lines unimpeded by an atmosphere, the metal deposits on the cooler surface of the workpiece. The rate of deposition is somewhat dependent on the skill of the operator, the company states; it takes 15 to 35 minutes to deposit 0.0005 in. of cadmium. The cycle may be repeated if the layer is not thick enough.

Heat radiated from the crucible and that given off as the vapor condenses will raise the temperature of the part. The maximum temperature is about 175° F.

• Cleaning of the work is required before vacuum plating to assure bonding.

As with other methods of coating, surface contamination can interfere with adherence. Parts are first grit blasted, using 180 mesh or finer abrasive; the blasting is done just prior to charging into the vacuum chamber.

Clean compressed air is used to blow any residual dust or abrasive from the parts before racking.

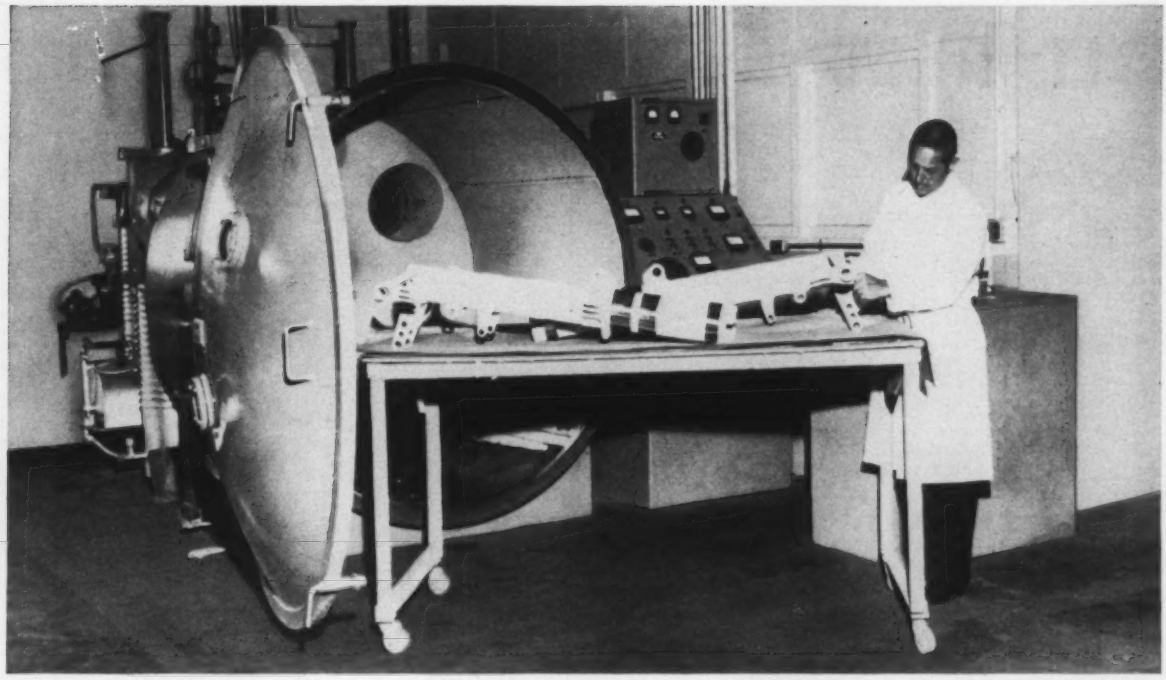
A surface that's too smooth may interfere with bonding. Adherence is poor on polished, Type 302 stainless steel, 2024 aluminum, chromium plate, and polished low alloy steel. The cadmium is fairly difficult to remove from chromium plated parts, so they are masked for the vacuum cadmium plating cycle.

Successive layers of the cadmium may be plated; they appear to act as a single layer. Microscopic examination shows no evidence of separate layers, says the company.

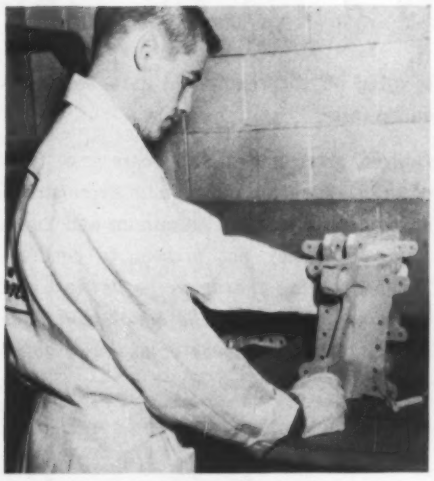
• Corrosion resistance of the coating is good.

Anadite reports that the vacuum plated coatings meet the corrosion requirements of QQ-P-416, a specification originally set up for electroplated parts. While a white, efflorescent film is developed, no rust is observed. Even when lines are scribed through the coating before testing, rust does not develop.

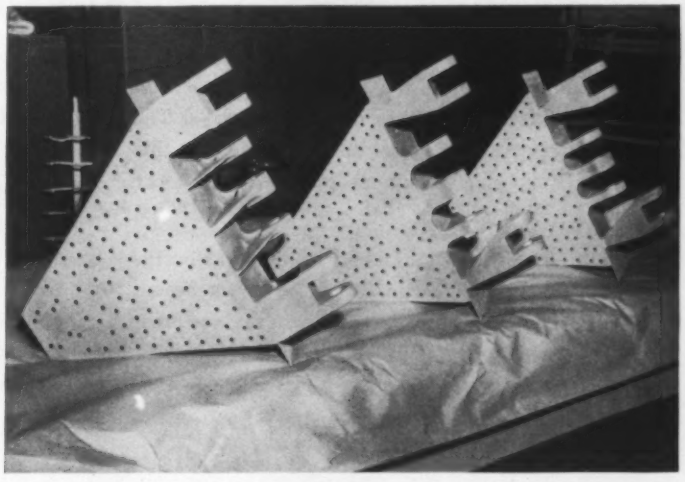
Cadmium electroplated parts are often posttreated for added corro-



Large vacuum plating chamber has full front opening. Mechanical and diffusion pumps are at rear. Unit handles large parts such as this landing gear strut



Wing fittings being inspected have had 0.0003 in. cadmium applied



These hinges for an inboard elevon have had 0.0005 in. of cadmium applied. They measure 12 by 15 in.

sion resistance by means of conversion coatings or organic finishes. The vacuum deposited cadmium layers can be treated in a similar fashion.

• There are differences between the vapor deposited and electroplated coatings.

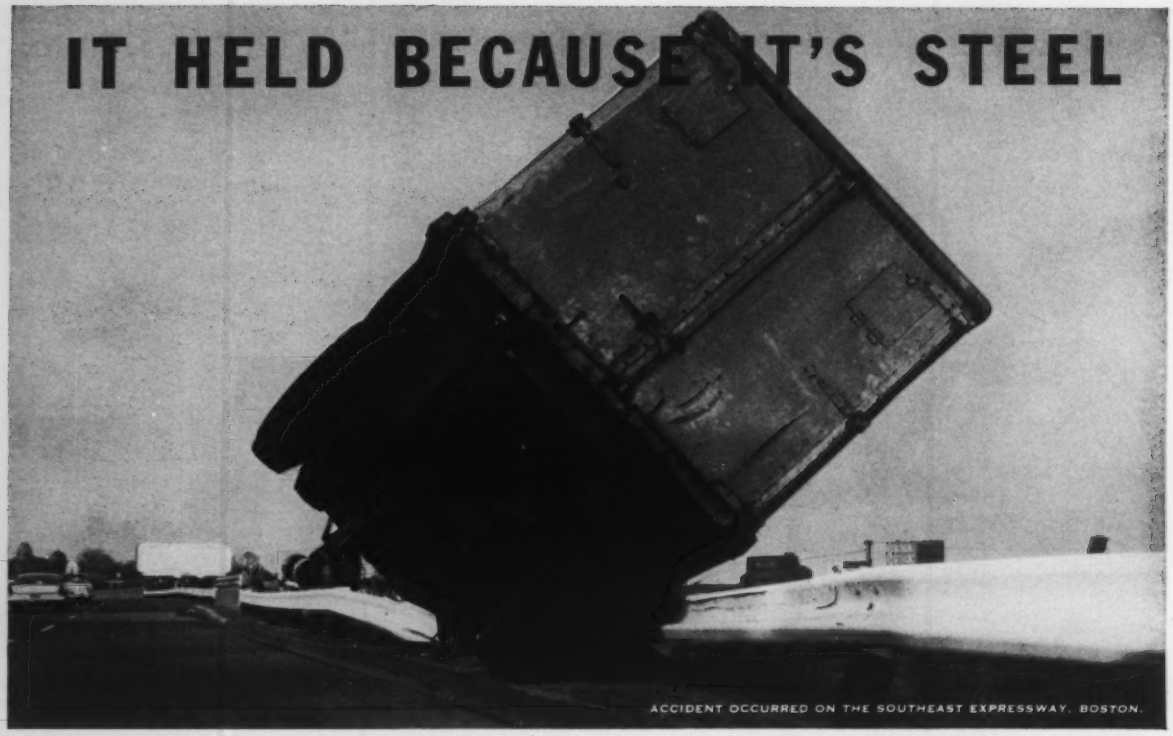
Vapor deposited coatings, says Anadite, are not as bright as those applied by electrodeposition. The finish is a dull matte, with a gray-white color. It usually has a superficial "dusty" layer. The coating may be buffed to improve the finish, but its protective value is not improved. Leaks in the vacuum chamber will cause dark spots to form in the coating, but they do not appear to have a harmful effect on corrosion resistance.

The vapor deposited coating is more porous than electroplates. The difference is not great—the specific gravity of a vacuum deposited coating is 8.12, while electroplated cadmium has a specific gravity of 8.22.

The Anadite vacuum unit is designed for commercial work.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, *Penton Bldg., Cleveland 13, Ohio.*

IT HELD BECAUSE IT'S STEEL



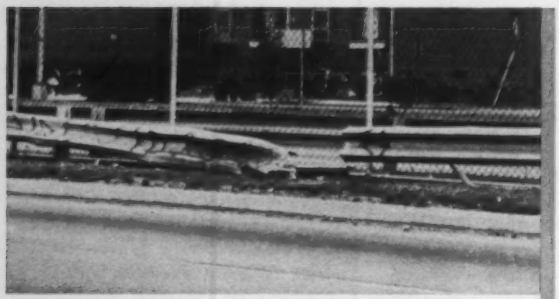
ACCIDENT OCCURRED ON THE SOUTHEAST EXPRESSWAY, BOSTON.

—Guarding Steel's Strength Is A Job For ZINC

This picture is a dramatic example of how steel guard rails are saving lives on our highways. The resilient strength of the steel rail and posts kept this truck from plunging down a steep bank to a highway below.

Results of steel guard rail installations on the New Jersey Turnpike, Cross County (Westchester, N. Y.) Parkway, Belt Parkway in New York and other major highways prove the life-saving ability of these barriers. Many of the 15,800 fatalities which in 1960 resulted from vehicles crossing to the wrong side of the road or going off the road could have been prevented by guard rails.

Galvanized steel guard rail costs less than competitive materials such as aluminum or concrete. In addition, it is stronger than aluminum and has a shock-absorbing resiliency not present in concrete barriers. *The zinc coating guards steel's strength and appearance against corrosion. The tough zinc hide can take the bangs and scratches of highway abuse without losing its protective ability.*



THIS GUARD RAIL DIDN'T HAVE STEEL'S STRENGTH—Aluminum guard rail on the Long Island Expressway was broken by collision impact.

—AND THE ZINC FOR THE JOB—

ST. JOE

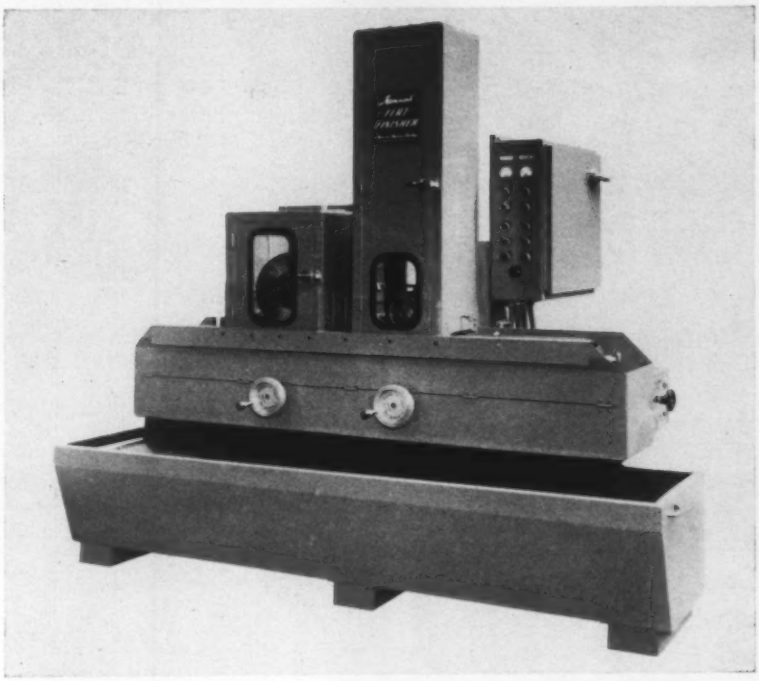
ST. JOSEPH LEAD COMPANY

250 PARK AVENUE

NEW YORK 17, NEW YORK

ZN-198

Abrasive or Brush Heads Optional on Flat Finisher



A COMBINATION flat finisher designed by Hammond can be equipped with abrasive belt grinding heads or with a head accommodating a wire or Tampico type brush for deburring and finishing.

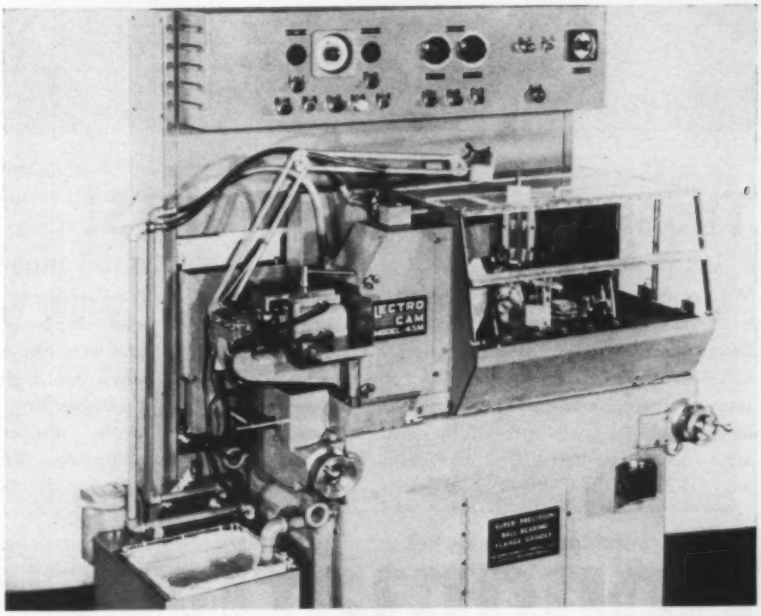
The flat finisher is available with single or multiple heads (up to four) and can be furnished in 6, 8, or 12 in. widths.

Design features include air tensioning on head and conveyor belts, automatic belt tracking, screw feed adjustment for depth of cut graduated in thousandths of an inch, variable speed conveyor drive from 0 to 60 fpm, variable density magnetic platens, and hold-down rollers.

Tooling is minimized and frequently is not required at all, says the manufacturer. The unit can quickly move from job to job.

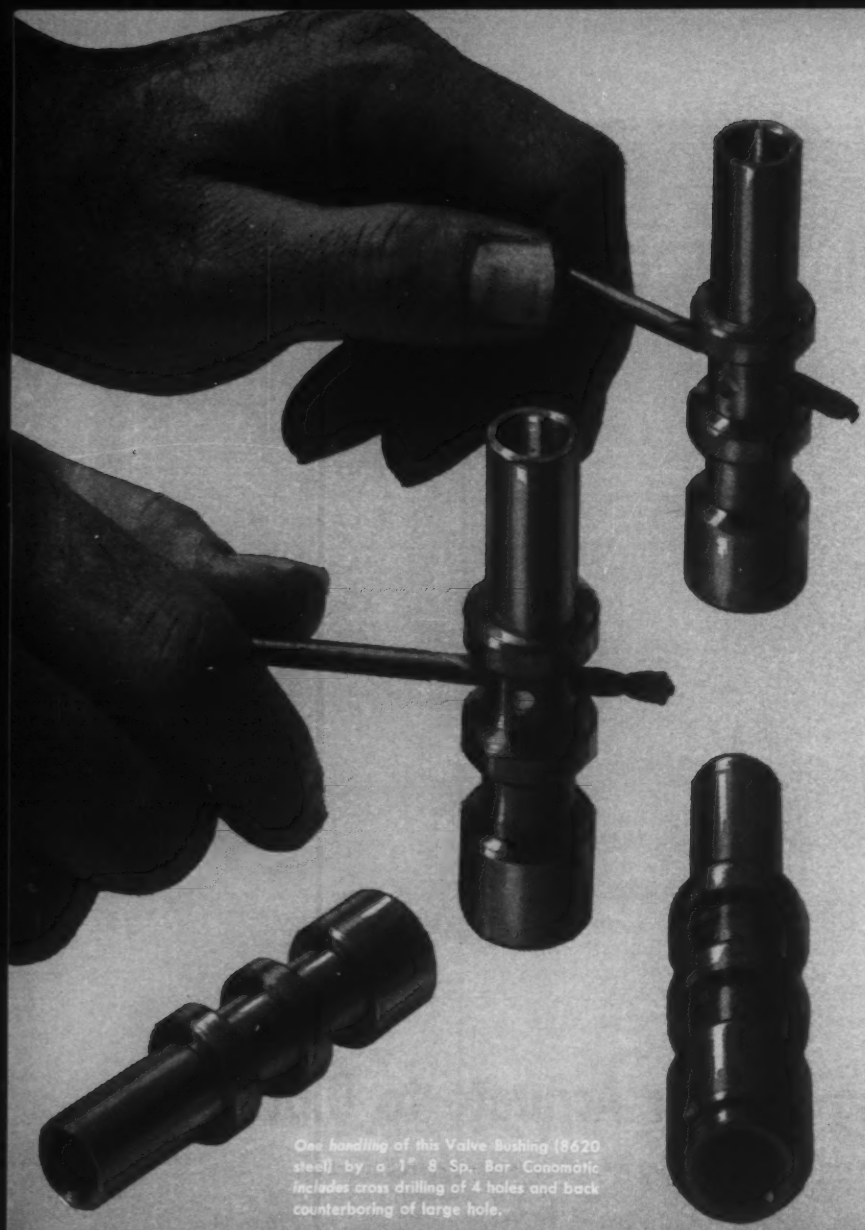
For further information, *write* Hammond Machinery Builders Inc., 1611 Douglas Ave., Kalamazoo, Mich.

Bearing Grinder Accurate to 0.00005 in.

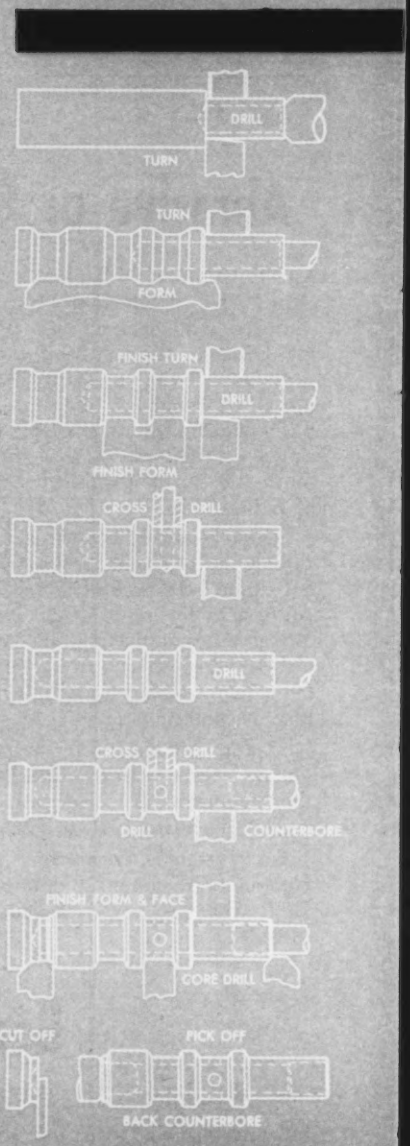


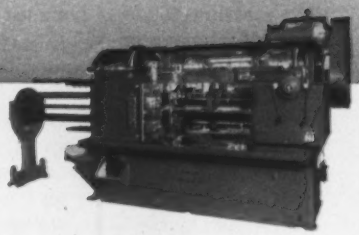
TOLERANCES closer than 0.00005 in. are possible with the plunge cut, bearing grinder designed by Van Norman, the 45 M Lectro-Cam. The geometry of outer flange races can be precisely controlled. The manufacturer says the unit's increased efficiency makes it possible for one operator to run more than one machine. The unit is designed for high speed production, rapid setup, and simple, low cost maintenance.

Simplicity enables the operator to easily adapt the machine to a wide variety of jobs. Standardized tooling permits use of more than one part size and reduces tooling cost. Says George Burns, Van Norman's vice president: "Savings in tooling alone can amount to as much as the base price of the machine itself." The unit has co-ordinated size control and automatic wheel



One handling of this Valve Bushing (8620 steel) by a 1" 8 Sp. Bar Conomatic includes cross drilling of 4 holes and back counterboring of large hole.





Those cost-saving EIGHTS!

With more work spindles and tooling positions for including — in one chucking — operations that would otherwise require the expense of second handling, you just can't *beat* THOSE COST-SAVING EIGHTS.

Likewise, as replacements of four spindle machines — on more simple work — with double stock feed and double setup, producing two pieces per cycle, nothing *compares* with THOSE COST-SAVING EIGHTS.

For ever-increasing work requirements — in less floor space, with less power, less coolant, less lubricant and maintenance, and less transfer and paper work — many "automatic" users are finding THOSE COST-SAVING EIGHTS more *profitable*. How about *you*?

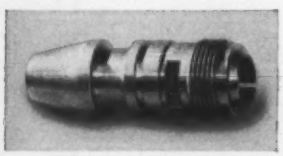
Write, wire, or phone *today* for particulars. There is no obligation. Cone Automatic Machine Company, Inc., P.O. Box 27, Windsor, Vermont.

Conomatic

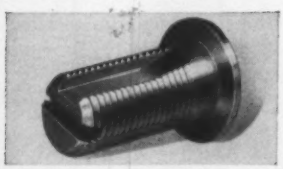
World's Most Productive Line of Automatic Lathes

Consistent, *dependable* handling of one or more of the following operations in a single setup has earned the CONOMATIC an enviable reputation as the *leader* of THOSE COST-SAVING EIGHTS: cross drilling and milling, end milling, broaching, spinning, stamping, OD and ID burnishing, eccentric drilling, turning and boring, eccentric forming, multiple hole drilling and tapping, oil groove rolling, back facing, back slotting, back hole drilling and counterboring, induction hardening and quenching.

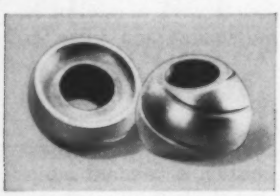
One handling **of this Ball Joint Housing (1012 steel) by a 2⅝" 8 Sp. Bar Conomatic *includes* burnishing inner ball race.**



One handling **of this Sleeve (B-1112 steel) on a 1⅝" 8 Sp. Bar Conomatic *includes* offset milling.**



One handling **of this Threaded Stud on a 1" 8 Sp. Bar Conomatic *includes* cross milling, slotting, thread chasing, and back facing (all operations without stopping the work spindles).**



One handling **of this Ball Joint (8620 steel) by a 2⅝" 8 Sp. Bar Conomatic *includes* the forming of the oil groove and deburring of the groove.**

One handling **of this 10¾" long Valve Stem (Monel Metal) by a 1⅝" 8 Sp. Bar Conomatic *includes* lead screw cutting of L. H. Acme Class III thread and burnishing of unthreaded section.**

NEW PRODUCTS and equipment

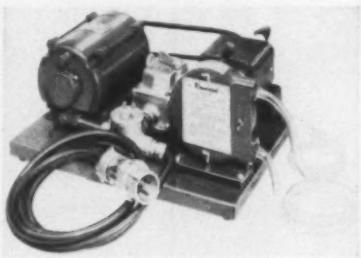
dressing. The electromechanical design compensates for wheel wear and automatically provides constant diminishing infeed control during the grinding cycle.

The building block design provides a detachable work head that allows other types of heads to be used, reduces machine downtime, and expands the range of applications. A hooded enclosure aids in mist control.

For further information, *write* Van Norman Machine Co., a division of Van Norman Industries Inc., 3640 Main St., Springfield 7, Mass.

Pump Redesigned for Flammable Gases, Liquids

A PUMP originally designed for corrosive, sterile, or abrasive liquids or gases has been redesigned to handle flammable liquids and gases.



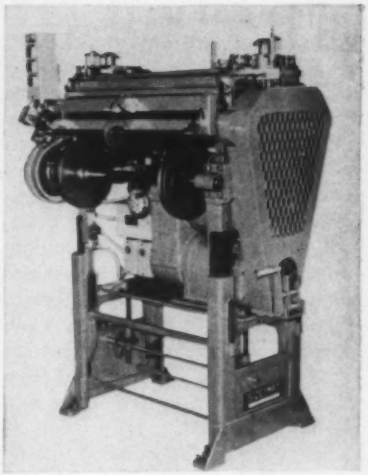
It's now available with a ¼ hp, explosionproof motor, switch, plug, and flexible conduit. Capacities of 54 and 185 gpm are available. Zero-Max speed control is optional.

For further information, *write* Randolph Co., 1018 Rosine St., Houston 19, Tex.

Flying Shear Adjustable For Widths Up to 24 in.

A SELF-powered flying shear, the Size-O-Mat, is adjustable for mild steel up to 24 in. wide and 0.032 in. thick. Machines for wider material can be provided.

Speed range is variable from 30 to 160 fpm and can be synchronized with other machines in the line. Various automatic controls are available.

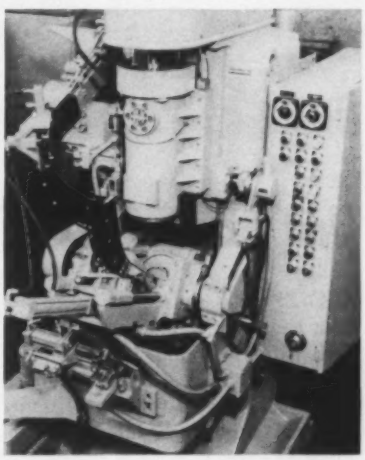


The Size-O-Mat can hold a tolerance of ±1/16 in. on 20 ft lengths with closer tolerances on shorter lengths. The shear is mechanically operated through a double cam system. No air or hydraulic equipment is used. Since the shear travels at the speed of the material, no tearing or jamming occurs, says the company.

For further information, *write* G. M. K. Precision Machines Inc., 26-04 Jackson Ave., Long Island City 1, N. Y.

Efficiency Improved on Spherical Milling Unit

A MACHINE designed for processing partial sphere type parts has been redesigned by Micromatic for greater efficiency and economy.



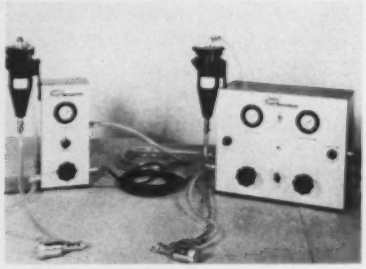
For example: An integrated hopper loader system built into the unit reduces loading time from 4

or 5 seconds to 1 second per part. Production capacity has also been increased 9 per cent. Also, the improved sizing control system makes possible greater accuracy and uniformity in finished part size.

Fourteen of the spherical milling units are being installed in a major automotive plant. They will replace 46 machines, says Micromatic. Total number of operations in the complete process has been reduced from 11 to 7. Tool costs have been substantially lowered.

For further information, *write* Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 38, Mich.

Paste Solder Applicator Speeds Automatic Lines



AN AUTOMATIC, paste solder applicator is designed to double output of automatic lines by making two simultaneous deposits of Fusion paste solders or paste brazing alloys.

The units can be individually controlled for the amount of deposit and in special situations can be cycled independently.

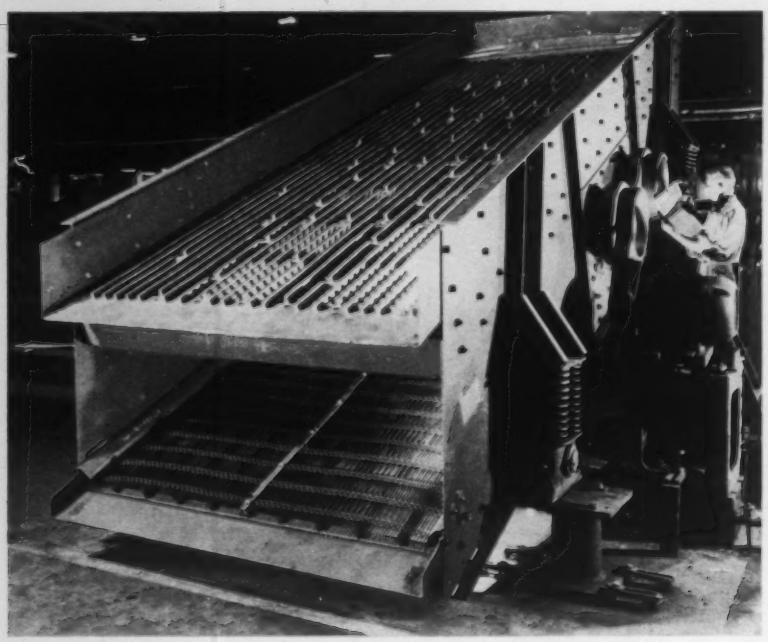
For further information, *write* Fusion Engineering, 17921 Roseland Ave., Cleveland 12, Ohio.

Low Friction Coating Adheres to Many Surfaces

MOLYBDENUM disulfide and Teflon have been combined in a low friction coating that can be sprayed, brushed, dipped, or roller coated onto a wide variety of surfaces. The coating (Molynamel) adheres to metals, wood, rubber, plastics, ceramics, and glass with or without a primer or pretreatment. It dries overnight to a dry, clean surface that is unaffected by water or contaminants, except esters and ketones. It cures at room temperature.

For heavy loads, Molynamel E coating may be baked at 300° F for 1 hour (depending on the temperatures the substrate material will stand). The material is said to lubricate effectively from the cryogenic range up to 400° F. Higher temperatures can be handled for short periods of time.

For further information, *write* Lubricants Div., Lockrey Co., Southampton, N. Y.



Unit Screens 1200 Tons of Ore per Hour

ABOUT 1200 tons of iron ore per hour can be screened on this double deck Ripl-Flo unit. The 8 x 20 ft unit is equipped with a synchronized, dual mechanism. Now under test, the unit is scheduled for shipment to Port of Vitoria, Brazil.

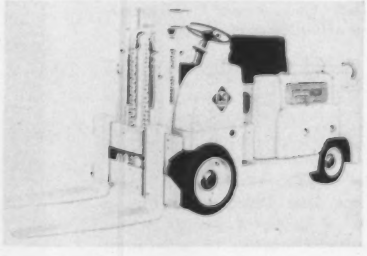
Top deck of the screen is $\frac{5}{8}$ in. manganese steel with 2 in. openings. The bottom is $\frac{1}{4}$ in. diameter, manganese steel, wire cloth with 7/16 x 5 in. rectangular openings. Two 20 hp, 1500 rpm, high torque motors drive the 825 rpm screen. Installation will include dual, steel springs to minimize vibration transmission.

For further information, *write* Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Lift Truck Line Expanded

THE CAPACITY range of Allis-Chalmers lift trucks have been increased by the F-120, a 12,000 lb capacity machine. The unit is designed for heavy work in steel mills, factories, warehouses, and other applications.

The unit can be powered by a gasoline, LP gas, or diesel engine. A heavy duty, two speed, constant mesh transmission is standard equipment. The two speed, torque con-



40-ton Plymouth M-Series Locomotive switches boxcars for Andersen Corp., Minnesota building products manufacturer whose annual production fills about 2700 cars.

"Handles 7 times the load of our former unit"

In the words of T. H. Fredrickson, Plant Engineer for Andersen Corp., Bayport, Minnesota: "Our Plymouth has proven to be an extremely durable piece of equipment—with the reserve power and positive braking action to perform our job efficiently and economically. It moves 7 times the load hauled by our former 10-ton locomotive, resulting in considerable savings to us in material handling costs. We would not be able to handle our present yard traffic without it."

The 40-ton gasoline-powered Plymouth Model "M" is equipped with Torqomotive drive. Used for switching freight cars in the plant rail yard, it works 30 to 35 hours a week, hauls 15 loaded boxcars or 20 empties over a 3-mile stretch of track with grades ranging up to 3%.

For full information on a Plymouth designed to fit **your haulage needs,** send a brief outline of your operations to: The Fate-Root-Heath Company, Dept. A-1, Plymouth, Ohio.

RAIL POWER

PLYMOUTH® LOCOMOTIVES

WITH TORQOMOTIVE DRIVE

ALSO BUILDERS OF F-R-H CERAMIC MACHINERY

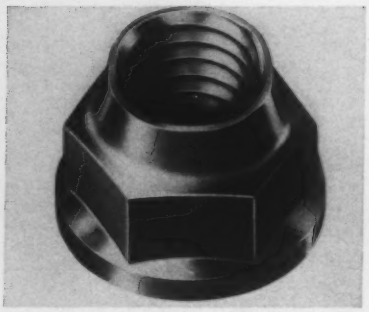
PLYMOUTH LOCOMOTIVES in Progressive Industry throughout the world

verter can also be provided. The standard carriage permits the application of a wide range of attachments. Included are standard and side shift clamps, revolving roll clamp, and side shifting carriages.

For further information, *write* Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Locknut Re-use Possible

A ONE piece, metal locknut developed by Allen is made from heat treated, alloy steel to permit repeated use with no significant impairment of the locking action. Locking is effected by a slight deformation of the top threads into an elliptical shape. In assembly, the out



of round threads create a powerful locking grip.

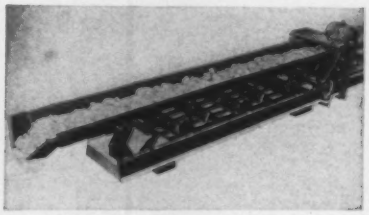
For further information, *write* Allen Mfg. Co., Hartford, Conn.

Vibrating Conveyors Reclaim Spring Energy

VIBRATING conveyors developed by Stephens-Adamson operate largely by reclaiming energy created by the natural frequency vibration of coil springs. The conveying capacity can be varied infinitely from zero to maximum while the conveyor is in operation.

The manufacturer says that once the coil springs start to vibrate at their natural frequency, they generate much of their own power. Only a relatively small amount of outside energy is required to keep them going.

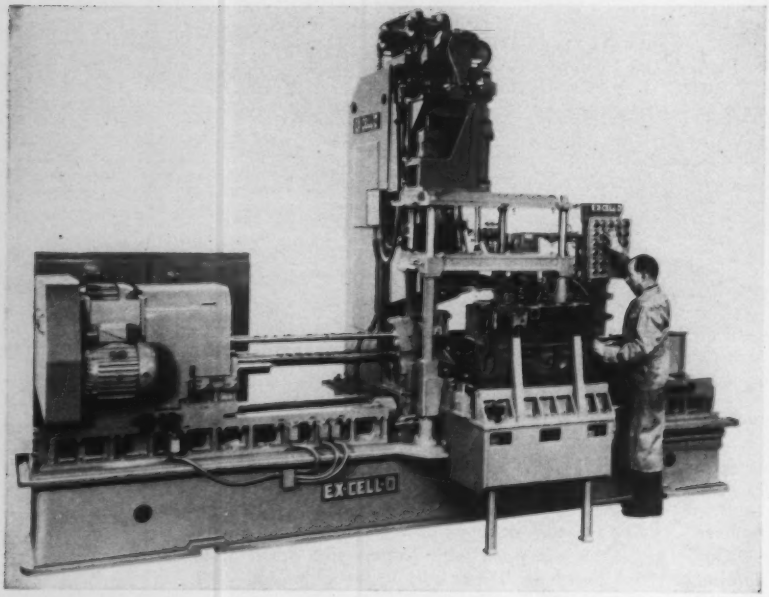
The additional power is supplied by a variable stroke, positive eccentric drive. A constantly controlled amplitude of stroke and flow material is assured regardless of the load placed on the conveyor. The gentle



tossing and catching motion is said to convey fragile products without breakage or damage. The dust problem in moving fine grain materials is practically eliminated. Most materials can be moved on inclines up to 10 degrees.

Dynamically balanced units which can be cable suspended or placed in unanchored positions are available.

For further information, *write* Stephens-Adamson Mfg. Co., Aurora, Ill.



Line Borer Includes Other Functions

THE MACHINE shown is designed for semifinish and finish line boring of cam and crankshaft bearings on engine cylinder blocks. Other functions: Finish boring two dowel holes at each end, finish machining the distributor hole, and milling a boss on the underside of the block. The machine has a semiautomatic cycle with manual loading.

For further information, *write* Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.

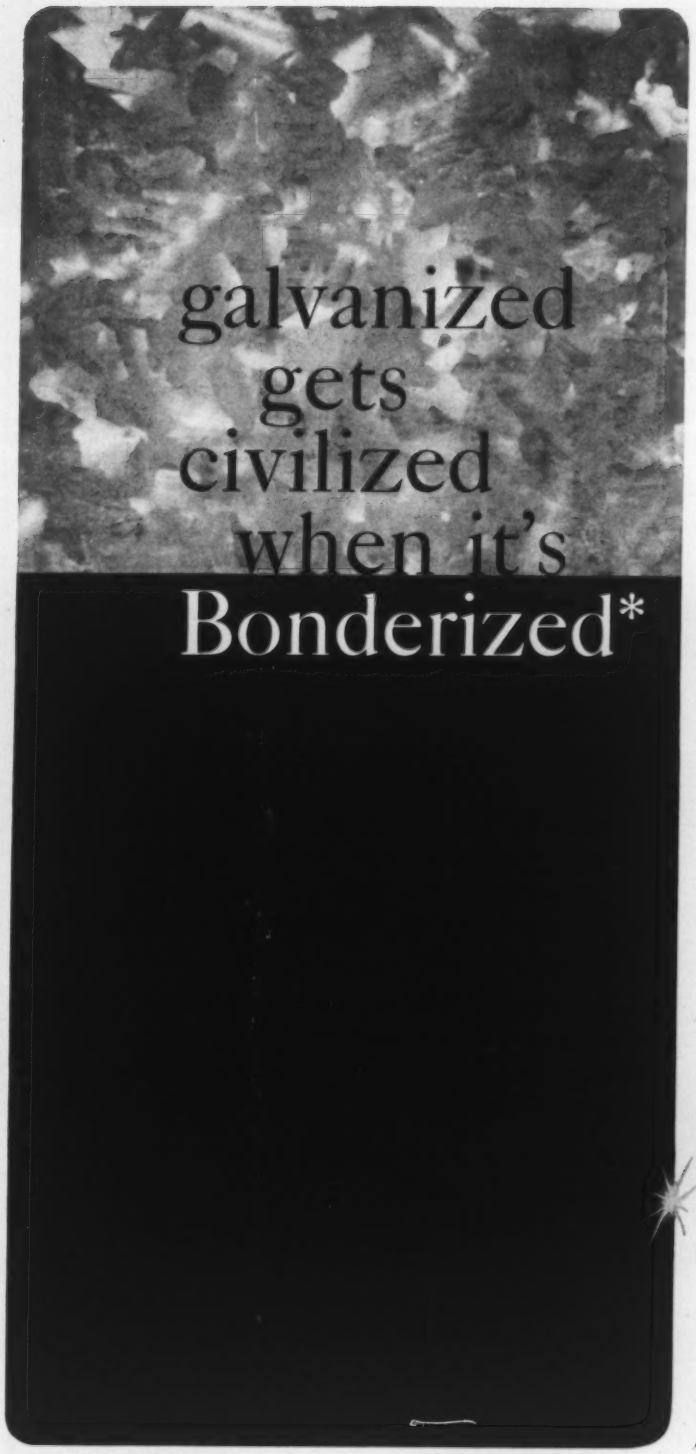
Unit Abrasive Finishes Surfaces to 8 x 24 in.

PRACTICALLY any flat surface that requires finishing, sizing, deburring, descaling, or snagging can be processed on a versatile machine developed by Acme Mfg.

The Model KC has conveyor belt feed and will finish parts made of metal, plastic, ceramics, wood, or rubber. Three sizes are available for parts 8 to 24 in. wide.

When used in tandem for two side finishing, an automatic part turnover mechanism can be incorporated.

Features: Pneumatic abrasive belt tension, positive manual or automatic belt tracking, micrometer



Galvanized is great for corrosion resistance, but it's a bad actor when you try to paint it.

Bonderite* phosphate coating tames that galvanized surface and makes it take and hold paint like a long-lost brother. What's more, the same Bonderite that's so good for galvanized is as effective on plain steel as any Bonderite in the list.

Now you can use a combination of painted steel and galvanized components for extra corrosion resistance, top appearance and customer satisfaction.

Write, today, for full information. Parker Rust Proof Company, 2158 E. Milwaukee, Detroit 11, Michigan.

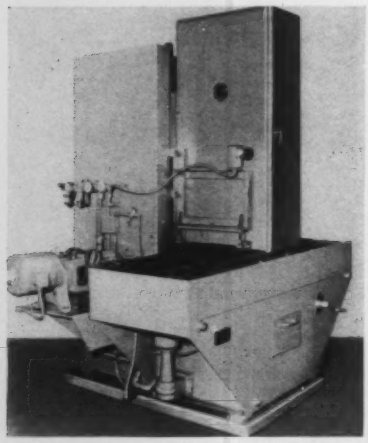
PARKER

FIRST IN SURFACE TREATMENTS FOR METALS SINCE 1914

*Reg. U.S. Pat. Off.

Photo shows bare galvanized surface (top), Bonderized surface (center), paint over Bonderite (bottom).

grind pressure adjustment, adjustable V-belt drive, infinitely variable control of conveyor belt speed, easily changed contact rolls and conveyor belts, and oil mist lubrication on all high speed bearings.

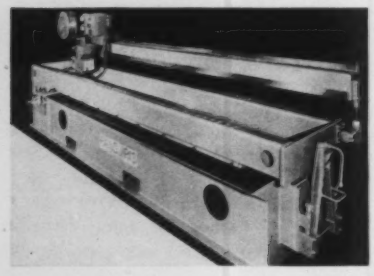


The unit can be equipped for wet or dry finishing. Application of oil spray, oil mist, and other finishing media can be provided to suit specific finish requirements.

For further information, *write* Acme Mfg. Co., 23716 Woodward Ave., Detroit, Mich.

Seamer Fusionwelds Formed Sheets, Plates

YOU can fusionweld flat, corrugated, or specially formed sheets and plates with a seamer made by Pandjiris. The development enables fabricators to quickly seam available stock widths of steel, stainless, aluminum, or nickel alloy into large sheets without distortion by clamping the edges to be welded against a machined, water cooled backup. Inert gas can be used if necessary. The company says the water cooled clamping allows 100 per cent penetration and quality welding from the top side.



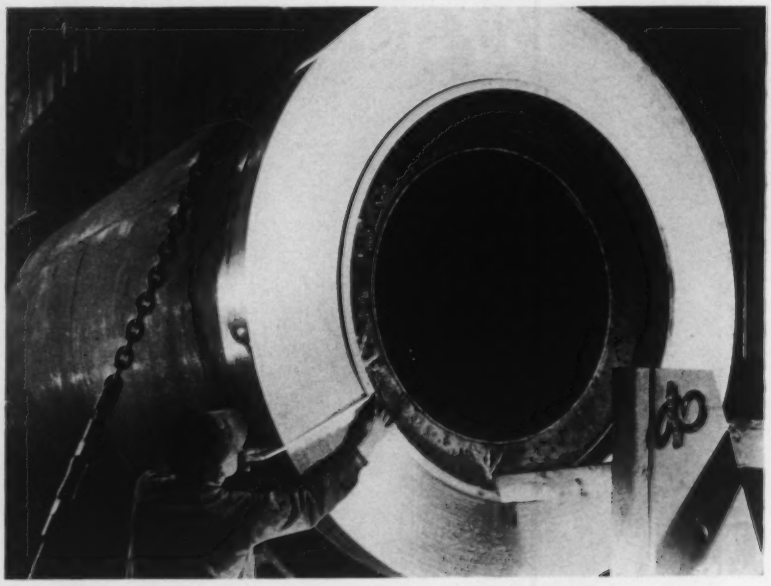
For further information, *write* Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis 10, Mo.

Ultrasonic Generator Has Special Feedback Controls

A 400 WATT, ultrasonic generator has special feedback controls that include the cleaning medium in the feedback loop. By automatically compensating for changes in temperature, load, and liquid level, the Sonomatic A-400 generator maintains maximum cleaning efficiency.

The company says only one simple control (the on-off switch) is needed for efficient operation. Another feature of the generator is the activity meter. The device indicates the presence of a gassy solution, improper cleaning chemicals, excessive loads, or other situations that contribute to low cleaning efficiency.

For further information, *write* Branson Instruments Inc., 40 Brown House Rd., Stamford, Conn.



Press Vessel Strengthened by Layers

MANY layers of thin steel make up the pressure vessel (developed by A. O. Smith) for the Verson-Allsteel hydraulic press. Layers of steel are progressively wrapped tightly in a special machine.

The vessel has a 56 in. ID and an over-all length of 16 ft 6 in. Weight is 103 tons. The assembled press is rated at 41,000 tons. Blanks are placed on a tray which has been moved into the bottom of the layered cylinder. A cycle in the production of the formed parts is completed in less than 2 minutes.

For further information, *write* Process Equipment Div., A. O. Smith Corp., Milwaukee, Wis.

STEELMAKING AT JESSOP

Survival? It could depend on a 3,000-mile picket fence

Ever-vigilant sentinels against surprise attack are the radar installations along the DEW Line. Stretching 3,000 miles across Canada and Alaska, this electronic fence is our first line of defense.

At bleak, lonely outposts Air Force and civilian technicians watch for tell-tale blips on radarscopes—Distant Early Warning of the possible approach of enemy aircraft or missiles.

This all-weather system must withstand the worst of the elements—sub-zero temperatures, high velocity winds, rain, snow and ice storms common to the Far North. And dependability of the equipment could determine whether or not we survive an attack.

There are numerous applications for specialty steels made by Jessop Steel Company in DEW Line installations. For example, forging quality alloys and wear-resistant tool steels for the gear mechanism of a rotating surveillance radar; cast-to-shape steel for certain other component parts and precision ground steels for delicate instrumentation.

Jessop is keenly aware of the importance of built-in dependability in the steelmaking process—whether meeting specifications for steel to be used in the nuclear reactor of a Polaris-firing submarine; a Redstone missile to launch an astronaut; an earth-girdling satellite; or a DEW Line radar installation.

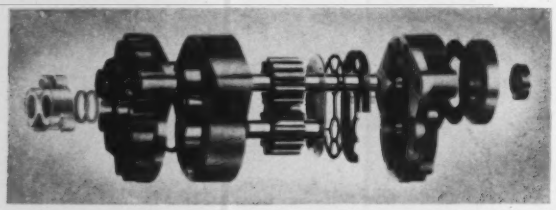
Yes, for dependability, you can rely on Jessop . . . the *big* name in specialty steel.

Plants and Service Centers:
Washington, Pa. • Los Angeles • Chicago • Detroit • Owensboro, Ky. • Wallaceburg, Ont.

JESSOP

Precisionaire gages qualify parts and tolerances to tenths on as many as ten simultaneous dimension readings.

This fleet of PRECISIONAIRE® gages...
controls Cessna quality at the machines



Six models of this Cessna hydraulic pump, used on farm and construction equipment, are gaged during production.

Honing machine operator checks valve body bore at 9 points at once, determines .0001" classifications.

"Without the proper type and quantity of gaging equipment, we never would have been able to produce such high quality hydraulic pumps, valves, and cylinders at such low relative costs," reports the Industrial Products Division of Cessna Aircraft Company.

Knowing that bad pumps correlate with lack of gaging equipment, Cessna has a complete set of gages for each model pump, ready to roll to the machines for quick setup and start of production. Thirty-five rolling gage cabinets, carrying more than 400 Precisionaire columns, are used in the production of these pumps.

All pump parts are produced to be completely interchangeable—there is no classifying or selective fitting. This results in minimum investment in parts inventory, a very rapid rate of assembly, and practically no reworks.

Interchangeable parts greatly simplify replacement problems. Inventory is at an irreducible minimum, service problems are negligible, and users are happy with the minimum maintenance and maximum performance of the pumps.

Write for The Cessna Story and Precisionaire Catalog SPG-160. The Sheffield Corporation, Dayton 1, Ohio.

The **SHEFFIELD** *Corporation* *Dayton 1, Ohio*

A subsidiary of The Bendix Corporation

Inspection Gages, Dimensional Control Instruments, Machine Controls, Automatic Gaging & Assembly Systems, Measuray® X-Ray Thickness Measuring, Crushtrue® & Multiform® Grinders, Cavitron® Ultrasonic Machine Tools, Press-Pacer® Transfer Units, Large Dies, Tooling, Contract Manufacturing.

NEW literature

Write directly to the company for a copy

Wire Cloth

The proper application of industrial wire cloth is described in a 28 page handbook. It includes a glossary of terms, application principles, and metal and protective coating selection. Specify publication R-100. Dept. RDT, National-Standard Co., Niles, Mich.

Plate Shear Calculator

A plate shear calculator in slide rule form is offered as an aid in finding shearing tonnage and other shear capability answers. Verson Allsteel Press Co., 9300 S. Kenwood Ave., Chicago 19, Ill.

Joist Specifications

The revised Standard Specifications and Load Tables for high strength, open web steel joists have been released in the form of a 52 page manual. Three types of joists are covered: Series J, LA, and H. Steel Joist Institute, Suite 715, DuPont Circle Bldg., Washington 6, D. C.

Preformed Ceramic Cores

How ceramic cores enable investment casters to meet the specifications demanded in hollow castings for aircraft and space vessels is shown in a reprint. Production of complex configurations is stressed. Sherwood Refractories, 16601 Euclid Ave., Cleveland 12, Ohio.

Applications for Tin

Tin and Its Uses, No. 53 presents case histories showing a variety of applications for tin. Tin Research Institute Inc., 492 W. Sixth Ave., Columbus 1, Ohio.

Corrosion Resistant Steels

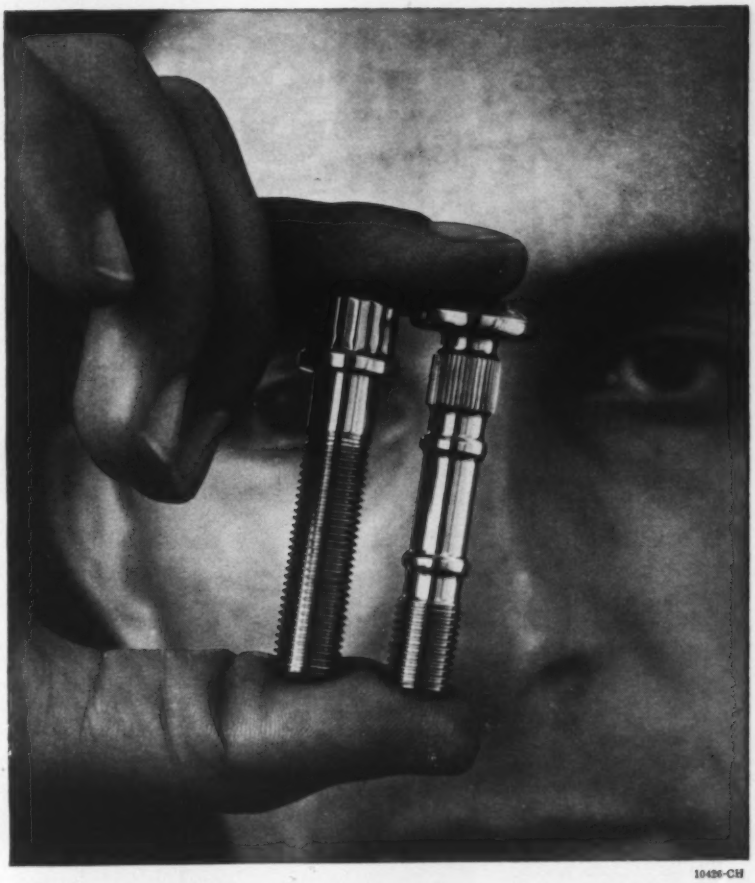
The Role of Molybdenum and Copper in Corrosion Resistant Steels and Alloys, a 60 page booklet, has been published by Climax Molybdenum. Economic and technological benefits of selecting the proper alloy for required performance are emphasized. Climax Molybdenum Co., a division of American Metal Climax Inc., 1270 Avenue of the Americas, New York 20, N. Y.

Heat Treating Steels

An article on heat treat methods (in a four page folder) touches on gas carburizing, liquid carburizing, neutral hardening, and induction heating. Aetna Ball & Roller Bearing Co., a division of Parkersburg-Aetna Corp., 4600 Schubert Ave., Chicago 39, Ill.

Power Supplies

Included in a 44 page publication offered by American Rectifier is a glossary covering terms used most frequently in power supplies, a basic power supply and control feature evaluation chart, an electroplating guide, and information on rectifier circuits. American Rectifier Corp., 95 Lafayette St., New York, N. Y.



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How *critical* can you be in your selection of a fastener for a special application . . . especially when extreme accuracy, reliability and consistent performance are specifications. For over thirty years, Chandler has been producing special fasteners and standard cap screws and bolts that meet these demanding requirements.

If you have a special fastener problem . . . here's what you can expect from Chandler. *Into the design* of your special fastener goes the knowledge of expert Chandler engineers . . . careful attention to detail and exhaustive testing to meet critical standards . . . advanced production methods to assure on-time delivery . . . RESULT . . . a precise fastener, custom-tailored and mass-produced at the most favorable cost.

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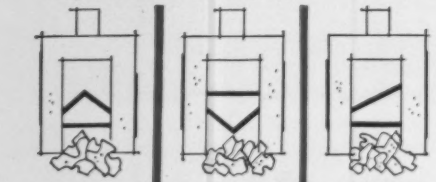
Choose the Hydraulic Shear Crosshead Knife and Bed Arrangement best suited to your operation. Only HARRIS makes this offer.



Inverted Vee Head Flat Bed | Horizontal Head Vee Bed | Guillotine Head Flat Bed

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Users Making Inventory Plans

EVEN THOUGH December is shaping up as the best month of this year for steelmakers, it will probably be less productive than any month in the first half of 1962.

The economy may not be heading for a boom, but the steel industry is — one that will last at least until the end of June. If autos, appliances, and other durables keep selling as well as they have been, steel consumption will reach a higher level by the second quarter than it attained at any time in 1961. What's more, steel buyers will be laying in big inventories to protect themselves against a possible strike when the steel industry's labor agreement expires June 30. If they increase their stocks by a month's supply, steelmaking operations will average at least 80 per cent of 1960 capacity in the first half of 1962 (vs. about 72 per cent currently). If they up their inventories by two months, steelmaking will average 90 per cent of 1960 capacity in the first half.

AUTOMAKERS' PLANS— In some industries, buyers may increase their inventories by as much as three months. Example: Automotive. Here's what a top purchasing official of Ford Motor Co.'s Ford Div. is saying in a letter to suppliers: "You are expected to take steel ordering action to accumulate sufficient raw steel prior to May 31, 1962, to cover our requirements through September and maintain your normal steel inventory at the end of September . . . to protect our position with your suppliers of steel, you should immediately reserve monthly tonnages through the first half of 1962 . . ."

At Chevrolet Motor Div., General Motors Corp. (and probably throughout GM), the objective is to have enough steel on hand by June 30 to complete the 1962 model run—it will phase out in July—and get a full month's production of '63s. If there's no strike, Chevrolet's inventory won't get down to normal size (120,000 tons) before Dec. 15, 1962. It's above normal now.

At Chrysler Corp., which normally carries about 90,000 tons of flat rolled steel, the inventory target is a three month supply (300,000 tons) by May 31. If there's a strike, Chrysler officials figure that their steel will last them until the end of October. If there's no strike, they won't deplete their inventory surplus until yearend.

OTHERS LOOK AHEAD— Although automakers have been more alert than other consumers in the matter of inventory planning, appliance manufacturers aren't far behind. They just haven't been as specific. Oil companies are saying that their aim is to have a 60 day supply of tubing, casing, and drill pipe in storage by June. Some of the smaller can companies have given the mills sizable tin plate releases for December and are making first quarter commitments.

LEADTIMES TO LENGTHEN— By mid-December, some of the smaller sheet mills will be operating close to capacity. By February, even the largest producers will be running full on flat rolled products. It will be necessary once again for users to get their orders in 45 days before the month in which they expect delivery.

PRODUCTION HOLDS— Look for ingot production in the week ending Dec. 2 to recover to around the 2,037,000 ton level recorded in the week ended Nov. 18. The Thanksgiving holiday reduced output to 2,015,000 tons in the week ended Nov. 25, STEEL estimates.

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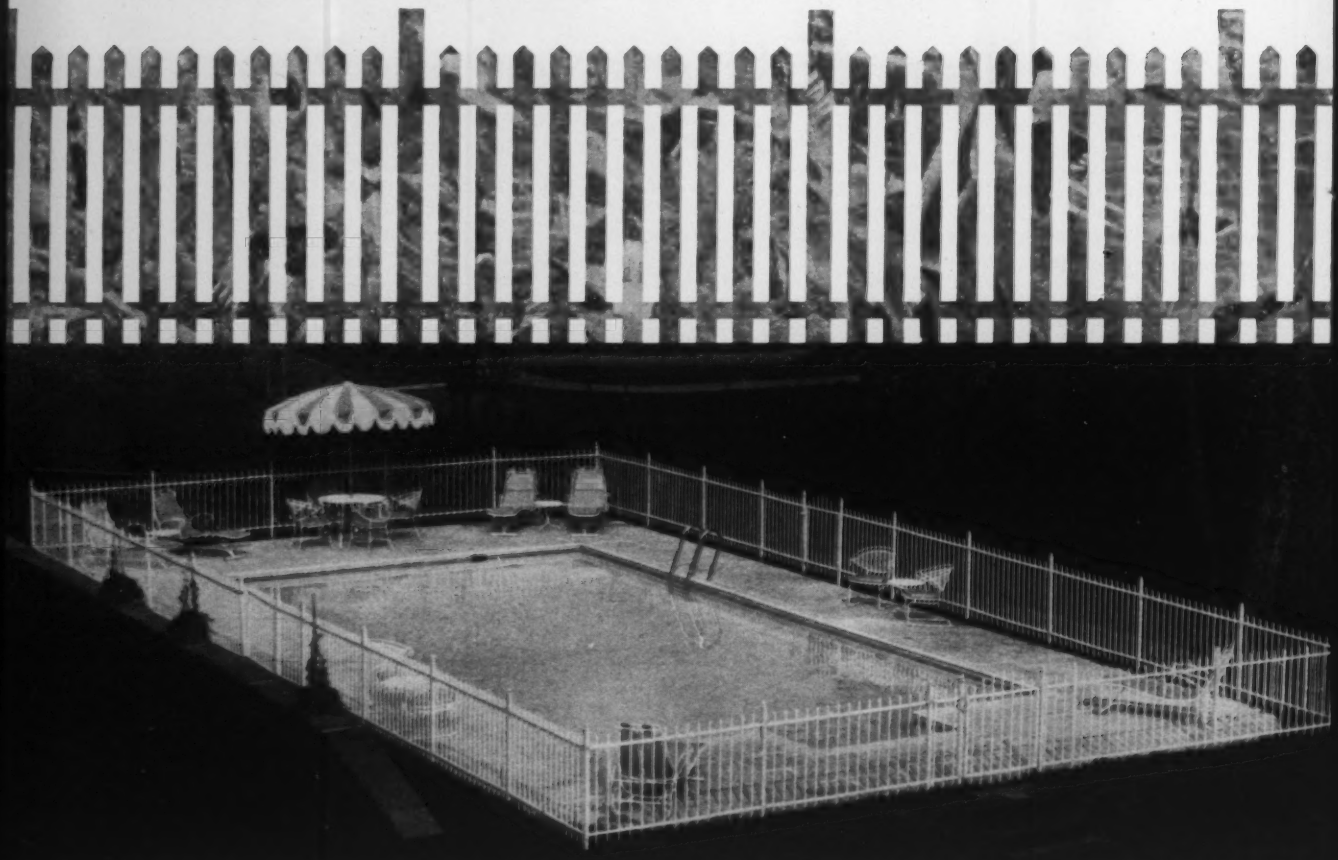
*Current prices were published in the Nov. 20 issue and will appear in subsequent issues.

The rich look of wrought iron, yet Westmoreland's new fencing is . . .



GUARDED BY GALVANIZED STEEL

You're looking at an attractive new idea in fences from Westmoreland Metal Manufacturing Company of Philadelphia. It's a steel fence made of square tubing which duplicates the traditional appearance of wrought iron. But it costs less and virtually eliminates maintenance problems.

It's made of galvanized steel, which means lasting protection from the punishing whims of Old Man Weather. Come rain, come snow, the zinc coating stays on guard for keeps. Galvanized steel also helps hold down the price of this fence because of its low initial cost and the ease with which it can be formed into desired shapes.

WEIRKOTE® IN PARTICULAR! The galvanized steel used in this new fence line is National Steel's Weirkote. To the inherent strength, economy and versatility of steel, Weirkote adds enduring zinc protection via the modern continuous process. As a result, Westmoreland president, Irving H. Kutcher, reports: "Weirkote comes through our fabricating operation without any harm whatsoever to its protective zinc coating. We never have to worry about chipping or peeling." Weirkote is manufactured by two National Steel Corporation divisions, Weirton Steel and Midwest Steel. Write Weirton Steel, Weirton, West Virginia, for further details.

MIDWEST STEEL
Portage, Indiana

WEIRTON STEEL
Weirton, West Virginia

Divisions of
NATIONAL STEEL CORPORATION

Exotic new alloys bring . . .

Breakthrough for Superconductivity

SUPERCONDUCTIVITY is the absence of electrical resistance.

At cryogenic temperatures near absolute zero (−459.6° F), certain metals and alloys allow the passage of electrons without hindrance. Once a current is introduced, it will flow indefinitely without dissipating energy.

The science of superconductivity, though still not fully understood, can be traced back to 1911. It remained a laboratory curiosity until 1957 and only now is the intensive research since that date beginning to bear fruit.

• ADVANCES in the field of superconductivity may open new metalworking markets and radically change many existing ones in the next few years.

If half of what is expected from superconductivity comes true, it will have a dramatic effect in such diverse fields as:

Computers . . .
Gyroscopes . . .
Power transmission . . .
Communications equipment . . .
Space flight . . .

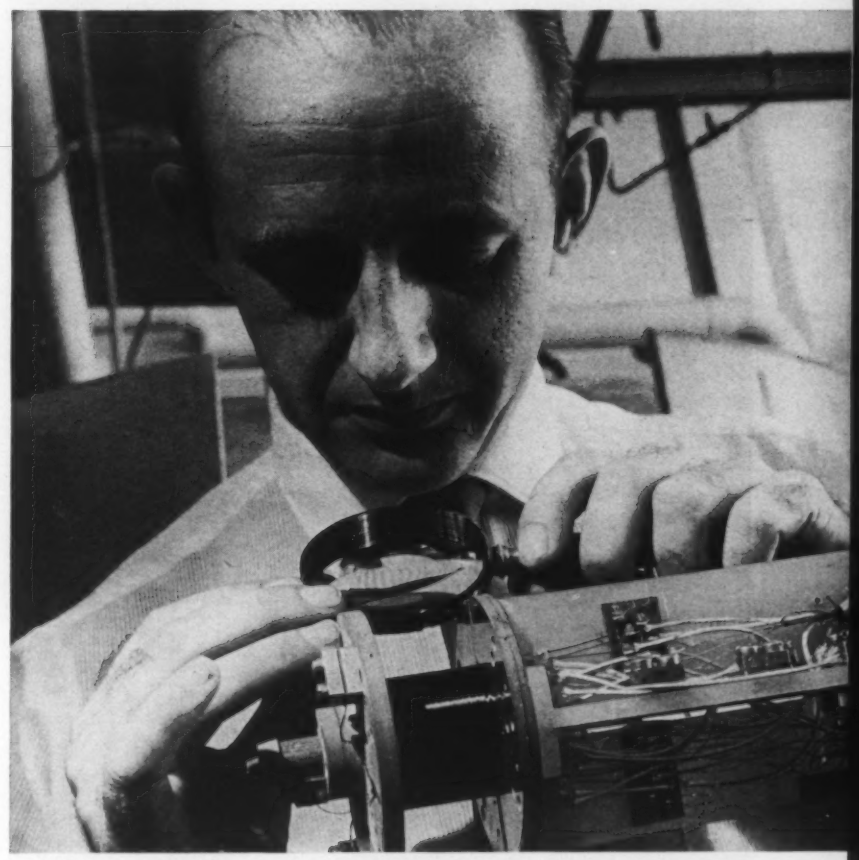
It may even open the door to controlled thermonuclear power.

• Today, there are two chief areas of interest within the field: 1. Creating high magnetic fields. 2. Controlling current flow.

A superelectromagnet is envisioned as result of work in the first area mentioned.

An example of the second would be a superconductive switch that would work in devices like data processing equipment; current flow would be controlled by taking advantage of the fact that moderate magnetic fields destroy superconductivity in most materials.

• Bell Laboratories scientists explain what the concept means in terms of some practical applications.



The small coil of wire is one of the most powerful magnets for its size, weight, and energy consumption. Westinghouse Electric Corp. scientists wound it from a material that is superconductive at extremely low temperatures

For one thing, they are excited over the potentials of powerful electromagnets that could be built and operated at a fraction of the costs of conventional types.

In ordinary conducting materials, much of the electrical energy which would otherwise create a magnetic field is converted to heat. A superconductor has zero resistance and remains superconducting in small magnetic fields. Resistance is restored to a superconductor by a magnetic field of sufficient intensity.

The scientists have also discovered a host of new superconducting alloys, the first materials found that remain superconductive in high magnetic fields. Strangely enough, the components of most of the alloys are much better known for their heat and corrosion resistance properties than for cryogenic abilities. Among the most promising:

• Columbium-zirconium is the most widely used alloy at present, but it's limited: It probably won't be effective in magnets with fields over 100 kilogauss.

It's the only one of the alloy groups that now can be readily fabricated in wire form for windings. Wah Chang Corp., for example, has

BOSTON Gear® QUALITY

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From local stock – at factory prices
Spur, helical, worms and worm gears.
1781 types and sizes, from 48 to 3 pitch.
Brass, steel, iron, and non-metallic.
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Quincy 71, Mass.

reported success in fabricating a couple of columbium-zirconium alloys (35 per cent zirconium in one and 33 per cent zirconium in the other) to sizes less than 0.010 in. diameter (in lengths of over 1000 ft).

• Columbium-tin would permit magnets of 200 kilogauss, but it's a difficult alloy to fabricate.

A fine wire is needed, since the magnetic field produced by a coil is proportional to the number of turns of wire in a given volume. The fabrication problem has been solved by Bell, and it is operating a columbium-tin magnet. The Bureau of Standards and others have found the columbium-tin alloy remains superconductive in pulsed magnetic fields as high as 180 kilogauss.

• Vanadium-gallium appears to be extremely promising.

The material has a high critical field. Current carrying capacity is similar to that of bulk columbium-tin.

• Vanadium-silicon is like columbium-tin in some respects.

It has similar characteristics. Also difficulties encountered in fabrication are somewhat alike. It is still being studied.

• Molybdenum-rhenium will find a niche.

It appears to have promise in small, superconductive magnets (up to about 16 kilogauss).

• Molybdenum-technetium is limited.

So far, the applications appear to be in fields similar in magnitude to those for columbium-zirconium.

• The advantages of a superconducting magnet are dramatically spelled out in an example by Bell:

The Murray Hill, N. J., laboratory has an 88 kilogauss, copper solenoid magnet. While in operation, it uses thousands of gallons of water per hour as a coolant and consumes 1.5 megawatts of electric power. The cooling towers, power switching gear, motor-generator set, and allied equipment fill several large rooms and cost several hundred thousand dollars. By contrast,

a superconducting magnet producing a comparable field would weigh only a few hundred pounds, would not consume any electric energy once the flux is established, and would probably cost 75 per cent less.

Bell has run an experimental, columbium-tin magnet up to 68 kilogauss and scientists believe that within the next six months they will operate a magnet with a field of 100 kilogauss.

Westinghouse Electric Corp. announced development a short time ago (see STEEL, Oct. 2, p. 64) of a doughnut sized, columbium-zirconium magnet that weighs only 1 lb but "creates a magnetic field twice as strong as that from a conventional iron-core electromagnet as large as an automobile, weighing 40,000 lb, and operated to saturation of the iron." Westinghouse's 58 kilogauss magnet runs from an ordinary auto storage battery; a conventional iron-core magnet needs its own powerplant to continuously supply the 100,000 watts or more of power needed for operation.

Atomics International Div., North American Aviation Inc., announced a 59 kilogauss magnet at the recent International Conference on High Magnetic Field held at Massachusetts Institute of Technology.

• Metalworking's stake: Development of the new alloys opens up a wide vista of possible applications employing superconductivity.

Power generation, in itself, would be a vast field. So would power transmission. An immediate application may be for small, powerful, but relatively inexpensive laboratory magnets. A great potential exists in new communications devices which utilize high magnetic fields.

One big potential is suggested by Bell's Dr. J. E. Kunzler: Thermonuclear power generation. "High magnetic fields are needed to provide 'magnetic bottles' to contain high temperature gas plasmas."

The electronics field, from traveling wave tubes to computers, is wide open. Westinghouse believes superconductivity makes possible a whole new generation of powerful atom smashers.

Superconductivity will have application to magnetohydrodynamic (MHD) power generation, space flight, and possibly a connection

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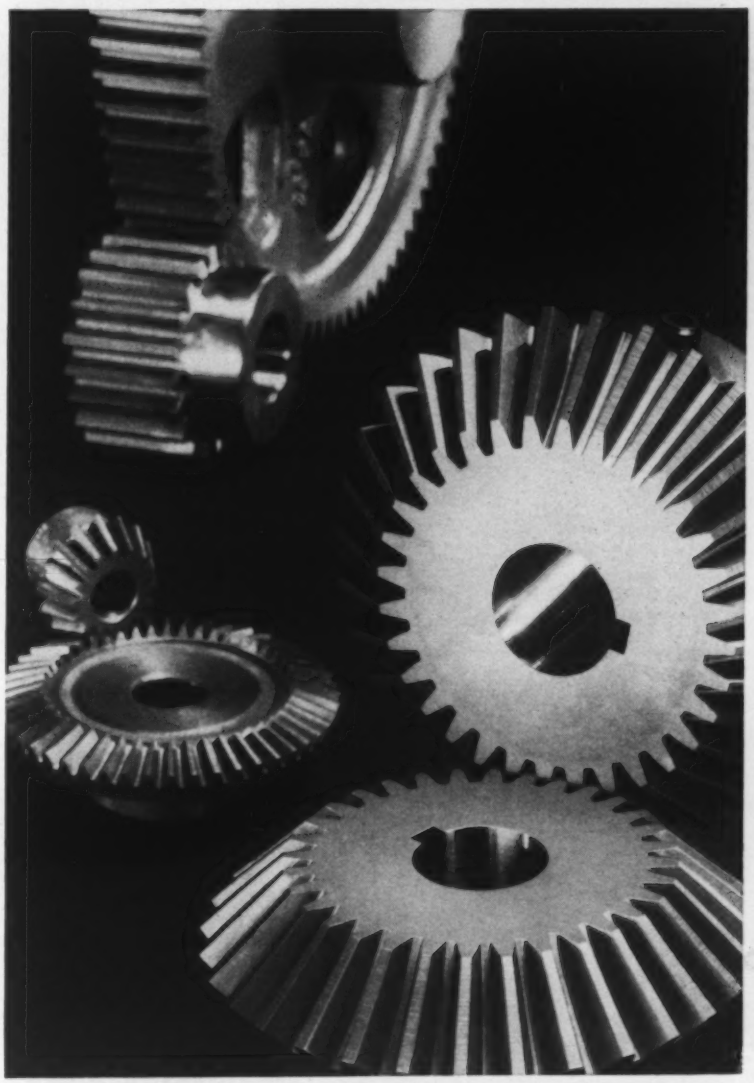

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with the problem involved in re-entry of large space vehicles into the earth's atmosphere (the superconductive alloys could be used to influence the flow of gas around a re-entry vehicle), says Dr. Arthur Kantrowitz, vice president of Avco Corp. and director of the Avco-Everett Research Laboratory.

Superconductive alloys might also be used to protect space ships from the effects of solar radiation and the devastating effects of solar flares, suggests Dr. Kantrowitz.

Steel Bars . . .

Bar Prices, Page 140

Although hot rolled bar bookings have picked up, producers don't expect their December shipments to be much larger than November's. They could book a lot more tonnage without overloading their mills, or falling behind on deliveries. They're still shipping most orders within two to three weeks of receipt.

After the first of the year, when big orders start coming in from automakers and their suppliers, the market should tighten appreciably. By February, it's expected that deliveries will probably range three to four weeks. If there's as much of a swing toward inventory building as there was in early 1959, bar producers may have to start restricting their acceptances. They'll probably want users to get their orders in 30 days before the start of the month when they want delivery.

Quality steels, such as hot topped grades, are sure to be in strong demand. Ingots will be in ample supply, but there may be a shortage of rolling capacity on specific units. Tight supply situations are more likely for products made on 20 or 22 in. mills than for items made on 10 in. mills. Much of the output from the bigger mills will be ticketed for automakers and machinery builders.

Bids close Dec. 13 on an estimated 115 tons of rifle barrel blanks, grade 4150 resulfurized, and Dec. 6 on 166 tons of hot rolled alloy bars, mostly 1 in., for the Springfield (Mass.) Armory. Heavier production of the M-14 rifle is stimulating the buying of alloys.

The Watertown (Mass.) Arsenal closes Dec. 5 on 600 tons of carbon bars for remelting. Sizes are to be 1½ to 1¾ in. square. Springfield Armory closes Dec. 14 on an additional inquiry for alloys, 52 tons of grade 4340, hot rolled, 2¼ in. square.

Outlook for Appliance Sales Reported Improved

The outlook for household appliance sales has improved.

Hotpoint Div., General Electric Co., reports its retail sales of home appliances this quarter will be substantially ahead of the 1960 fourth quarter. The company predicts a retail sales gain of 3 to 5 per cent next year over sales in 1960.

Whirlpool Corp. reports unit sales of its RCA Whirlpool brand appliances for the first ten months of 1961 exceeded those of the comparable 1960 period, the first gain to date in 1961. Jack D. Sparks, vice president, reports unit sales for the year will exceed 1960's by 2 or 3 per cent. Dollar volume will be about the same.

The resurgence in shipments be-

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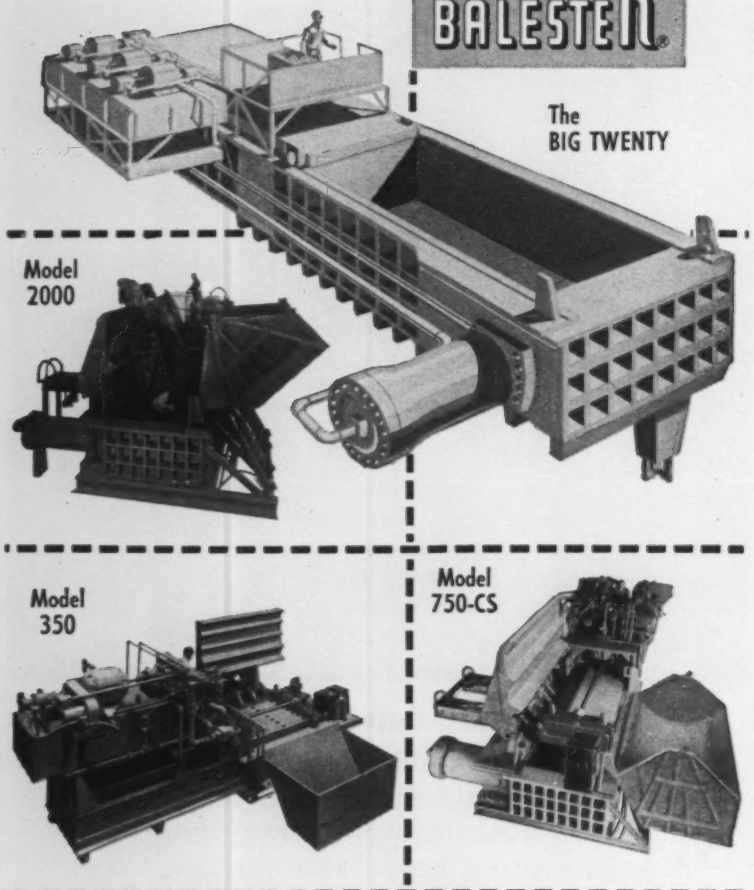

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gan last May but sales were still down from 1960 by nearly 12 per cent in mid-July. September and October closed the margin dramatically.

Foreign Competition Stiff in Texas Market

Steel production in Texas would be higher were it not for the strong competition from imported products. The gap between domestic and imported steels ranges about $15 a ton on average. There is continued speculation that foreign steel at the mill level may become even more competitive, though a supplier of imported steel within the last week posted some higher prices.

Other representatives of European mills indicate new orders are dragging, which has given rise to the expectation lower prices on foreign steel are coming. Most foreign mills offer a rolling schedule of from three to four months, and another two to four weeks are required for transportation.

Plates . . .

Plate Prices, Page 140

The Sparrows Point, Md., shipyard of the Bethlehem Steel Co. is low bidder on the construction of a 14,100 ton, passenger-cargo-container ship for the Grace Line. Bethlehem's bid was $17,957,000. Like her three sister ships, now under construction at Sparrows Point, the new vessel will have special facilities for carrying 147 containers along with general cargo capacity of 648,820 cu ft.

On Jan. 8, 1962, the Navy Bureau of Ships will close on a combat store ship, 16,100 tons displacement. The vessel is to be 581 ft long, with a 70 ft beam.

Pending work includes 2500 tons for the Packwood power project in Lewis County, Wash. Involved are 17,000 ft of 72 in. steel pipe and 5800 ft of penstocks.

Some platemakers think December will be one of the best months of the year. Shipments may reach the highest level since early 1960, they say, and new orders may set the stage for a strong first quarter. The most active buyers are machinery builders, missile base subcontractors, and miscellaneous fabricators.

FOR SEGMENT OR CIRCLE BENDING OF ANGLES
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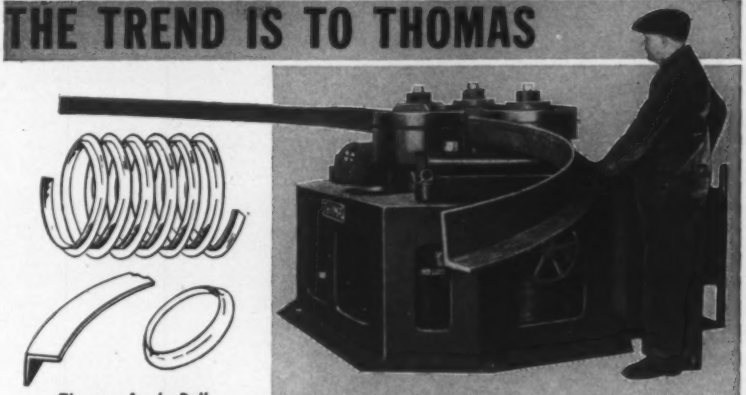

Thomas Angle Rolls will handle angles up to 6 x 6 x 7/8"

Thomas Angle Benders are of all steel construction and come in two styles and four sizes. Standard rolls permit "leg in" and "leg out" bending of angles. The machines may be converted for bending flats, rounds, squares, beams, channels, pipe and other shapes.

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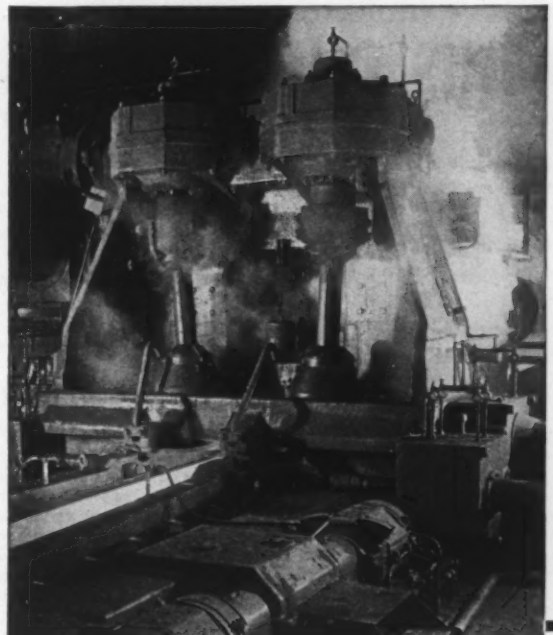

Edging hot strip steel

No place for second-best equipment. That's why this heavy-duty vertical overdrive edger uses rugged Cone-Drive **double-enveloping worm** gearing to drive the vertical rolls continuously.

Rugged Cone-Drive gearing is available in gearsets, speed reducers and gearmotors.

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Here's how **Thor E. Christensen** of the **Allbright-Nell Co.** feels about their installation.

"We have now had our Abell-Howe 10/2 Ton Crane in service for 6 months, and we would like to say that it is performing to our highest expectations. The 70 F.P.M. 2 Ton hook is a real time saver, and the 15 F.P.M. 10 Ton hook takes care of our heavy lifts with no strain. Even after 6 months we are still surprised at the quietness with which this crane operates. The savings in operating expense as well as initial outlay of the 2 hook trolley versus a single hook high speed 10 Ton crane is appreciable.

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Deliveries on most products are still good, but deliveries of wide plates are becoming extended. Producers are quoting five to six week delivery from their 160 in. mills.

The buying tempo is expected to pick up noticeably after the turn of the year. Users who can forecast their long range requirements—tank fabricators and service centers—are expected to start building inventories. If the 1959 pattern is repeated, the first strike hedge orders will hit the mills by mid-January.

It's uncertain whether users will try to accumulate as much tonnage as they did in 1959. One Pittsburgh area producer said recently: "After the last strike, we caught up in a hurry and shipped so fast that people started yelling uncle. Some of them are going to remember that. Maybe they'll feel safe with smaller inventories than they built last time."

Heavy plates required for weldments are in better demand in New England, partly due to Naval Shipyard subcontracts. Tank volume is off, and plate fabricating shops are estimating less tonnage. Electrical machinery needs are fairly well maintained, as are papermill replacement needs. Requirements of chemical works are spotty.

Tubular Goods . . .

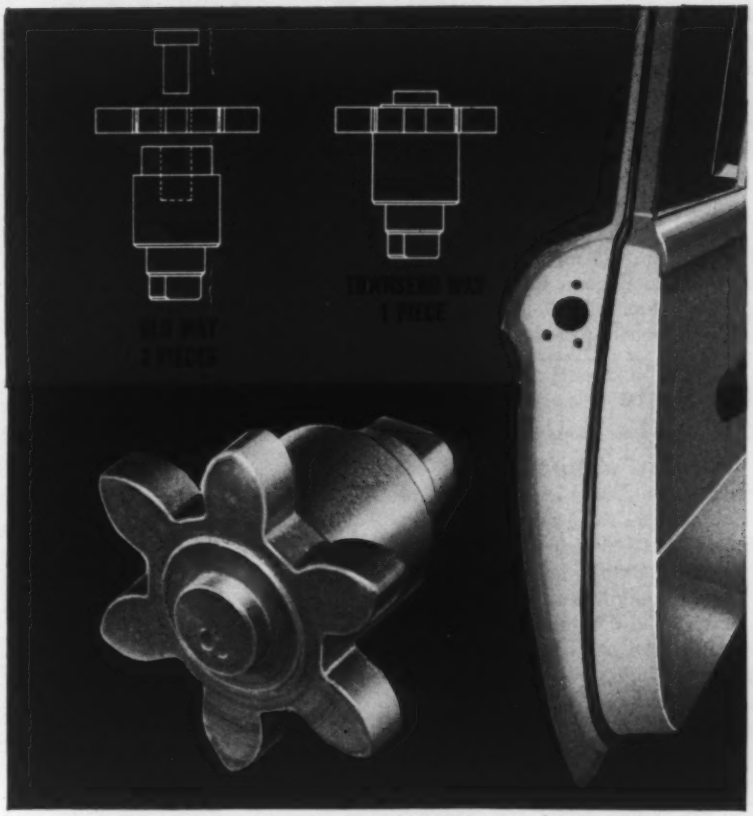
Tubular Goods Prices, Page 144

The market for oil country goods is firming up. Inventory liquidation has ended, and tubemakers are shipping steel as fast as it's being consumed. November shipments will be about the same as October's—higher than September's but not as good as August's when sales were helped by inventory building in Texas. December shipments are expected to equal August's and may prove to be the best for the year.

Users haven't started hedging against the possibility of a steel strike in mid-1962, but they're starting to talk about an inventory buildup. Several oil companies have indicated their aim is to have a 60 day supply of tubing and casing by June.

The mills have some first quarter business on their books already, but it's not of the strike hedge variety.

Demand for line pipe is sluggish and shows no signs of improvement.



Auto maker saved $22 per thousand with Townsend Ultra-Special part

This Ultra-Special part is made by the Townsend Ultra-Special cold-forming process for $22 less per thousand pieces than the former three-piece assembly made by another method.

One of these automobile door latch rotors is used in each car door by a major manufacturer. Their annual savings—by using this part—is quite substantial.

Cold forming adds strength to make a tougher part while holding dimensional tolerances. In developing these Ultra-Special parts, Townsend's engineers combine such processes as cold-heading and impact extrusion—or, interim heat treatments and coatings. The result is an extended range of standard production equipment far beyond ordinary limitations.

You benefit directly by using Townsend Ultra-Special parts in the assembly of your products. Your increase in profit potential is a direct combat to competition. A Townsend engineer will be happy to discuss your production assembly. Write Townsend Company, P. O. Box 71-C, Ellwood City, Pa.

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Several pipelines that have been planned and approved by the Federal Power Commission are being held up by financing difficulties.

Orders for buttweld and electric-weld pipe started to drop in November as construction activity waned seasonally.

A subsidiary of Southern Pacific Co., San Francisco, will build a $6.5 million, 113 mile pipeline from Portland to Eugene, Oreg., to carry gasoline, fuel oil, diesel fuel, and other petroleum products.

Tin Plate . . .

Tin Plate Prices, Page 142

Shipments of tin plate will accelerate in December as some of the smaller can companies start building inventories. They've given the mills sizable releases and are making commitments for the first quarter of 1962. After the first of the year, the two biggest canmakers may start buying heavily as a hedge against a possible midyear steel strike.

Can company executives are predicting a 50 per cent increase in the use of soft drink cans in 1962. Walter F. Donaldson Jr., Jones & Laughlin Steel Corp., Pittsburgh, last week said if the can industry were called upon to supply soft drink packages for 10 per cent of the market, the market for tin plate would be enlarged by a quarter of a million tons.

Steelmaking Rate Declines

OBSERVANCE of the Thanksgiving holiday, coupled with downward revisions in schedules to bring output in line with the rate of new billings, resulted in a drop in ingot tonnage to an estimated 2,015,000 tons for the week ended Nov. 25. It represents a decline of 1.1 per cent from the previous week's total.

• **Chicago**—Steelmaking was scheduled at 77 per cent of 1960 capacity for the week ended Nov. 25, a gain of 1 point. Most mills are making small boosts in their ingot schedules despite the Thanksgiving holiday.

• **Youngstown**—Steel ingot production at major mills in this area was scheduled to fall to 59 per cent of 1960 capacity from 61 per cent for the preceding week. The Thanksgiving holiday cut sharply into industrial activity in the area, but it did not have much effect on basic steel schedules. Sharon Steel Corp. closed another open hearth.

• **Buffalo** — Steel ingot production slipped an additional 2½ points to 54 per cent of 1960 capacity during the week ended Nov. 25. Bethlehem Steel Co. shut down an open hearth at its Lackawanna, N. Y., plant and is now working 17 of its 35 open hearths. Those in use are the new, larger units, including some employing oxygen lancing. Republic Steel Corp. continues to operate four of nine furnaces, Wickwire Spencer Steel, one of three.

• **Philadelphia**—A slight decline in ingot production in the Northeastern district was scheduled for the week ended Nov. 25. In the previous week, the AISI index was up 3 points to 105.

Steel orders continue to expand modestly, with the uptrend likely to accelerate after the turn of the year as consumption increases, mill deliveries tighten, and stock buying becomes more pronounced.

• **Birmingham** — The steelmaking rate for the Birmingham-Atlanta area of the Southern district dropped about 3½ points to 60 per cent of 1960 capacity in the week ended Nov. 25. One producer curtailed operations to meet requirements of his order book; another producer experienced a temporary slowdown because of repairs on a large open hearth furnace.

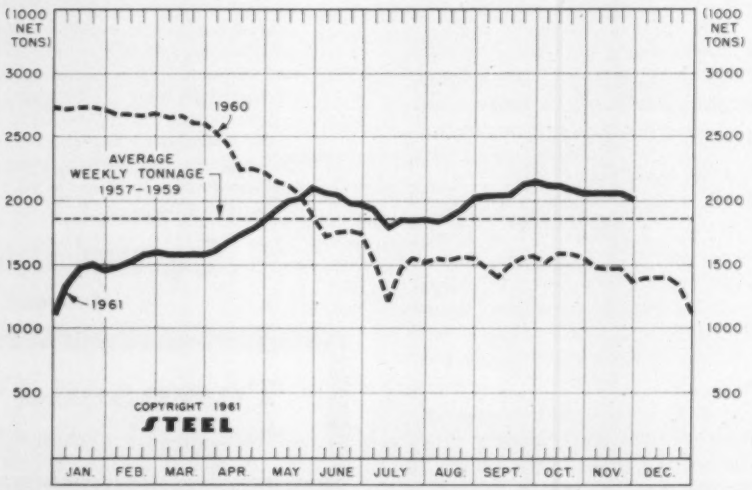
• **Cincinnati** — Production of steel ingots eased to an estimated 100,115 tons in the holiday shortened week. The rate: About 87 per cent of 1960 capacity.

STEEL INGOT PRODUCTION

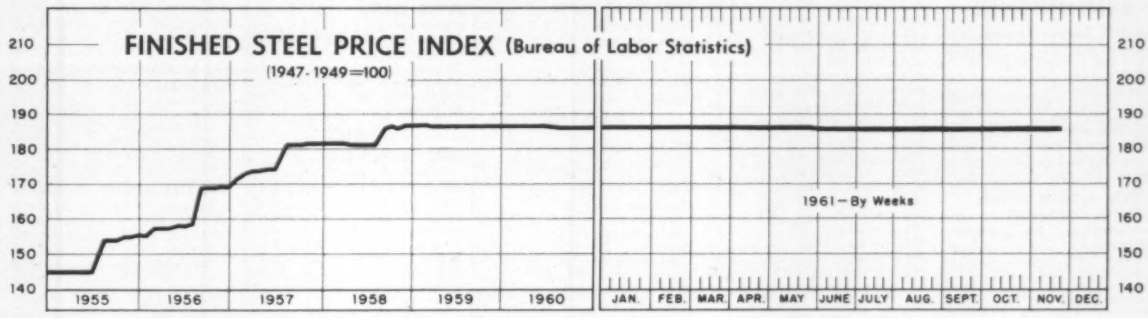
Weeks Ended	Net Tons	Change
Nov. 25	2,015,000*	— 1.1%
Nov. 18	2,037,000	— 0.4%
Nov. 11	2,046,000	+ 0.1%
Totals to Nov. 18		
1961	84,848,000	— 6.2%
1960	90,442,000	

DISTRICTS	Week Ended Nov. 18 Tons‡	Index†	Week Ended Nov. 11 Index†
Northeastern	280,556	105	102
Buffalo	97,355	100	97
Pittsburgh	407,585	101	103
Youngstown	166,581	98	100
Cleveland	100,003	108	115
Detroit	154,228	147	147
Chicago	422,706	113	112
Cincinnati	104,813	139	138
St. Louis	74,096	141	125
Southern	102,976	95	103
Western	125,097	107	110
Industry	2,037,000	109.3	109.8

*Estimated by STEEL.
†1957-59 (1,862,933 tons) = 100.
‡District tonnages are approximate and will not necessarily add to the national total.



Price Indexes and Composites



Nov. 21, 1961	Week Ago	Month Ago	Nov. Index	Year Ago
185.4	185.4	185.4	185.4	186.2

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Nov. 21

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, H.R., Carbon	6.675
Rails, Light, 40 lb	7.292	Bars, Reinforcing	(N.A.)
Tie Plates	6.875	Bars, C.F., Carbon	10.710
Axles, Railway	10.175	Bars, C.F., Alloy	14.125
Wheels, Freight Car, 33 in. (per wheel)	62.000	Bars, C.F., Stainless, 302 (lb)	0.570
Plates, Carbon	6.350	Sheets, H.R., Carbon	6.350
Structural Shapes	6.167	Sheets, C.R., Carbon	7.300
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, Galvanized	8.775
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, C.R., Stainless, 302 (lb)	0.643
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Carbon	9.225
Bars, H.R., Alloy	10.775	Strip, C.R., Stainless, 430 (lb)	0.460
Bars, H.R., Stainless, 303 (lb)	0.543	Strip, H.R., Carbon	6.250
		Pipe, Black, Buttweld (100 ft)	19.495
		Pipe, Galv. Buttweld (100 ft)	23.098
		Pipe Line (100 ft)	195.423
		Casing, Oil Well, Carbon (100 ft)	193.028
		Casing, Oil Well, Alloy (100 ft)	302.645
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	192.285
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (Bundles)	7.647
		Nails, 8d Common (50 lb)	4.715
		Wire, Barbed (80-rod spool)	8.372
		Woven Wire Fence (20-rod roll)	20.910

STEEL's FINISHED STEEL PRICE INDEX

	Nov. 22 1961	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg = 100)	247.82	247.82	247.82	247.82	225.92
Index in cents per lb	6.713	6.713	6.713	6.713	6.111

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$149.96	$149.96	$149.96	$149.96	$137.66
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	62.63
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	62.18
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	63.41
Steelmaking Scrap, GT	33.00	33.00	38.33	28.83	62.00

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Nov. 22 1961	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	5.075
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	5.075
Bars, H.R., deld., Philadelphia	5.98	5.98	5.96	5.98	5.35
Bars, C.R., Pittsburgh	7.65	7.65	7.65	7.65	6.85
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	5.00
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	5.00
Shapes, deld., Philadelphia	5.745	5.745	5.745	5.745	5.40
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.85
Plates, Chicago	5.30	5.30	5.30	5.30	4.85
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	5.25
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.85
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	5.35
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.675
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.675
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	5.75
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	5.75
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.75-5.85
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	6.30
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.675
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.675
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	6.85
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.85
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	6.95
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	7.20
Nails, Wire, nonstock, Pitts	8.95	8.95	8.95	8.95	8.20
Tin Plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.65	$9.95
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$91.50
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.40	6.40	6.40	6.40	5.80

PIG IRON, Gross Ton	Nov. 22 1961	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$63.50
Basic, Valley	66.00	66.00	66.00	66.00	62.50
Basic, deld., Philadelphia	70.18	70.18	70.18	70.18	66.26
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	63.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	63.00
No. 2 Fdry, deld., Phila.	70.68	70.68	70.68	70.68	66.76
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	59.00
No. 2 Fdry (Birm.), deld., Cin.	70.20	70.20	70.20	70.20	66.70
Malleable, Valley	66.50	66.50	66.50	66.50	63.00
Malleable, Chicago	66.50	66.50	66.50	66.50	63.00
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	235.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$33.50	$33.50	$37.50	$26.50	$62.50
No. 1 Heavy Melt, E. Pa.	34.00	34.00	40.00	34.00	59.00
No. 1 Heavy Melt, Chicago	31.50	31.50	37.50	26.00	64.50
No. 1 Heavy Melt, Valley	33.50	33.50	37.50	26.50	66.50
No. 1 Heavy Melt, Cleve.	30.50	30.50	34.50	23.50	65.00
No. 1 Heavy Melt, Buffalo	28.50	29.50	31.50	23.50	59.50
Rails, Rerolling, Chicago	57.50	57.50	58.50	46.50	87.50
No. 1 Cast, Chicago	39.50	39.50	41.50	36.50	50.50
COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.00	$14.50
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	17.50
Oven, Fdry., Milwaukee	32.00	32.00	32.00	32.00	29.50

Steel Prices

Mill base prices reported to STEEL, Nov. 22, cents per pound except as otherwise noted. Code number following mill point indicates producing company. Key to producers, page 141; footnotes page 143. *Changes shown in italics.*

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOT, Alloy (NT)
Detroit S41 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS
Carbon Rolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ....80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ....80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3 ....99.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ....99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. C8 ....99.50
Seattle B3 ....109.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5, W14 ....99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$119.00
Bridgeport,Conn. C32 ....119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3 ....121.00
Detroit S41 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ....119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2 ....119.00
LosAngeles B3 ....139.00
Lowellville O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Seattle(6) B3 ....140.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14 ....119.00
S.Duquesne,Pa. U5 ....119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S.Chicago,Ill. R2,W14 ....122.50
S.Duquesne,Pa. U5 ....122.50
Warren,O. C17 ....122.50

SKELP
Aliquippa,Pa. J5 ....5.05
Benwood,W.Va. W10 ....5.05
Ind.Harbor,Ind. Y1 ....5.05
Munhall,Pa. P5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ....6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
IndianaHarbor,Ind. Y1 ....6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
Buffalo S47 ....6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2 W14 ....6.40
SparrowsPoint,Md. B2 ....6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ....5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1 5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ....5.55
LosAngeles B3 ....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14 ..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Struthers,O. Y1 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2 ..5.50
Lackawanna,N.Y. B3 ..5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Sterling,Ill. N5 ....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa, Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ....8.10
LosAngeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Phoenixville,Pa. P4 ....8.10
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14 ..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 ....7.75
Struthers,O. Y1 ....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ....8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05
Sterling,Ill. N15 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ....5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ....5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ....6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ....6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
Alabama City,Ala. R2 ....5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ....5.30
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. P4 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ....5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ....6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ....5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B2 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. P4 ....7.05
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....14.10

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer Ala. T2 ....7.95
Clairton,Pa. U5 ....7.95
Claymont,Del. P4 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ....7.95
Economy,Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1 ..7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.85
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Sterling, Ill. N15 ....7.625
Warren,Ohio R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Claymont,Del. P4 ....7.50
Coatesville,Pa. L7 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Ky. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2..7.50
Youngstown Y1 ....7.50

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..5.55
Ashland l.c.l. (15) A10..6.05
Cleveland c.l. R22 ....6.05
Warren,O. R2 ....6.05

FLOOR PLATES
Cleveland J5 ....6.375
Claymont,Del. P4 ....6.375
Conshohocken,Pa. A3 ..6.375
Ind. Harbor,Ind. I-2 ....6.375
Munhall,Pa. U5 ....6.375
Pittsburgh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ....5.675
Aliquippa,Pa.(9) J5 ....5.675
Alton,Ill. L1 ....5.875
Atlanta(9) A11 ....5.875
Bessemer,Ala.(9) T2 ....5.675
Birmingham(9) C15 ....5.675
Buffalo(9) R2 ....5.675
Canton,O.(23) R2 ....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ....6.425
Fairfield,Ala.(9) T2 ....5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1..6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P2 ....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O.(23) R2 ....6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
N.Tonawanda S47 ....5.675
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle(9) A24,B3,N15..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9)N15 ..5.675
Sterling,Ill.(9) N15 ....5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11 ..6.375
Warren,O. C17 ....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.725
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1 6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
N.Tonawanda S47 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Seattle(6) B3 ....7.825
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14..6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H. R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Sterling,Ill. N15 ....7.925
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2..5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ....5.675
Tonawanda,N.Y. B12..5.675

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.425

BAR SIZE ANGLES; S. SHAPES Wrought Iron
Economy,Pa. B14....16.45

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Loaded (Including loaded extra) Carbon
LosAngeles P2, S30...11.75*

Alloy
Ambridge,Pa. W18....10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.5c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 ....8.10
Buffalo B5 ....7.70
Camden,N.J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, H5, P17 ....7.85
Detroit S41 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O. W8 ....7.65
FranklinPark,Ill. N5....7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2..7.65
Hartford,Conn. R2....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N.J. W18 ....8.10
NewCastle,Pa.(17) B4..7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
Seattle(49) S30....9.10
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
Willimantic,Conn. J5 ....8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ....9.025
Camden,N.J. P13 ....9.20
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit H5, S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O. W8 ....9.025
FranklinPark,Ill. N5 ..9.025

Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. R5 .....9.025
Lackawanna,N.Y. B3 ..9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ..9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
N.Tonawanda S47 .....9.025
Plymouth,Mich. P5 ....9.225
S.Chicago, Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ...9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

Atlanta A11 .....5.00
Birmingham C15 .....5.25
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fontana,Calif. K1 ....6.375
Ind.Harbor,Ind. Y1 ....5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.475
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. W14 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Steelton,Pa. B2 .....5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Williamsport,Pa. S19 ..5.75

BARS, Reinforcing, Billet (Fabricated, to Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Johnstown,Pa. B2 .....7.33
Lackawanna,N.Y. B2 ...7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
Seattle A24, B3, N14 ..7.95
Williamsport,Pa. S19 ..7.00
SparrowsPoint,Md. B2 ..7.33
St.Paul U8 .....8.17

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 16.10
Economy,Pa.(D.R.)B14 20.50
Econ.(DirectRolled)B14 13.55
Economy(Staybolt)B14 20.50
McK.Rks.(S.R.) L5 ...16.10
McK.Rks(D.R.) L5 ...20.50
McK.Rks.(Dir.Rolled)L513.55

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ...5.575
Franklin,Pa. (4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ...5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ...5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ...5.20
Ind.Harbor,Ind. I-2, Y1 .5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 .....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14..7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ....5.35
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Aliquippa,Pa. J5 .....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 .....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(38) B2 ...9.275
Pittsburgh J5 .....9.275
SparrowsPoint(33) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.125	....
Ashland,Ky. A10	7.125	7.375
Canton,O. R2	7.125	....
Fairfield,Ala. T2	7.125	7.375
Gary,Ind. U5	7.125	7.375
GraniteCity,Ill.G4	7.225	....
Ind.Harbor I-2	7.125	7.375
Irvin,Pa. U5	7.125	7.375
Kokomo,Ind. C16	7.225	....
MartinsFry. W10	7.125	7.375
Pitts.,Calif. C11	7.875	....
Pittsburgh J5	7.125	....
SparrowsPt. B2	7.225	....
Weirton W6	7.125	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.375

SHEETS, Enameling

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
SparrowsPoint,Md. B2..6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel

Follansbee,W.Va. W10 .7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

SHEETS, Aluminum Coated

Butler,Pa. A10(type 1) 9.525
Butler,Pa. A10(type 2) 9.625
Irvin,Pa. U5 (type 1)..9.525

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325
Geneva,Utah C11 .....6.80

SHEETS, Galvanized High-Strength, Low Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.175
Irvin,Pa. U5 .....7.175

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Canfield,O. C3 .....7.50
Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50

SHEETS, Galvanized Steel Hot-Dipped§

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875‡
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.H'rb'r,Ind. I-2, Y1 6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10..6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous. §For minimum spangled add 0.15c.

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A25 Algoma Steel Corp. Ltd.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Branford Machine & Mfg.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Canfield Steel Co.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co., Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire Div., Hoover Ball & Bearing
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E2 Eastern Stainless Steel
E6 Empire-Reeves Steel
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H5 Hercules Drawn Steel
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
J10 Jay Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
M23 Mill Strip Products Co. of Pennsylvania

N1 National Standard Co.
N2 National Supply, Armco Steel Corp.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N17 National Steel Corp.
N20 Neville Ferro Alloy Co.

O1 Ohio Ferro-Alloys Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P10 Precision Strip Mill Div., Solar Steel Corp.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P25 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Div., Bliss & Laughlin Inc.
S31 Sawhill Tubular Products
S40 Seneca Steel Service
S41 Stainless & Strip Div., J & L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
S45 Somers Brass Co.
S46 Steel Co. of Canada
S47 Seaway Steel Div., Roblin-Seaway Industries

T2 Tenn. Coal & Iron Div. U. S. Steel Corp.
T3 Tenn. Products & Chemical
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope, Armco Steel Corp.
U4 Universal-Cyclops Steel
U5 U. S. Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloy Steel
V3 Vulcan Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Div., National Steel Corp.
W8 Western Cold Drawn Steel Div., Standard Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27)	R2 ...5.10
Allenport,Pa.	P7 .....5.10
Alton,Ill.	L7 .....5.30
Ashland,Ky.(8)	A10 ....5.10
Atlanta	A11 .....5.10
Bessemer,Ala.	T2 .....5.10
Birmingham	C15 .....5.10
Conshohocken,Pa.	A3 ...5.15
Detroit	M1 .....5.10
Ecorse,Mich.	G5 .....5.10
Fairfield,Ala.	T2 .....5.10
Farrell,Pa.	S3 .....5.10
Fontana,Calif.	K1 ....5.825
Gary,Ind.	U5 .....5.10
Ind.Harbor,Ind.	I-2, Y1.5.10
Johnstown,Pa.(25)	B2 ..5.10
Lackaw'na,N.Y.(25)	B2.5.10
LosAngeles(25)	B3 .....5.85
LosAngeles	C1 .....8.60
Minnequa,Colo.	C10 ....6.20
Riverdale,Ill.	A1 .....5.10
SanFrancisco	S7 .....6.60
Seattle(25)	B3 .....6.10
Seattle	N14 .....6.60
Sharon,Pa.	S3 .....5.10
S.Chicago,Ill.	W14 .....5.10
S.SanFrancisco(25)	B3 ..5.85
SparrowsPoint,Md.	B2 ..5.10
Torrance,Calif.	C11 ....5.85
Warren,O.	R2 .....5.10
Weirton,W.Va.	W6 .....5.10
Youngstown	U5, Y1 ....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa.	S18 .....8.40
Farrell,Pa.	S3 .....8.40
Gary,Ind.	U5 .....8.40
Houston	S5 .....8.65
Ind.Harbor,Ind.	Y1 ....8.40
KansasCity,Mo.	S5 .....8.65
LosAngeles	B3 .....9.60
Lowellville,O.	S3 .....8.40
Newport,Ky.	A2 .....8.40
Sharon,Pa.	A2, S3 .....8.40
S.Chicago,Ill.	W14 .....8.40
Youngstown	U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky.	A10 .....7.575
Bessemer,Ala.	T2 .....7.575
Conshohocken,Pa.	A3 ..7.575
Ecorse,Mich.	G5 .....7.575
Fairfield,Ala.	T2 .....7.575
Farrell,Pa.	S3 .....7.575
Gary,Ind.	U5 .....7.575
Ind.Harbor,Ind.	I-2, Y1.7.575
Lackawanna,N.Y.	B2 ..7.575
LosAngeles(25)	B3 ....8.325
Seattle(25)	B3 .....8.575
Sharon,Pa.	S3 .....7.575
S.Chicago,Ill.	W14 ....7.575
S.SanFrancisco(25)	B3.8.325
SparrowsPoint,Md.	B2 .7.575
Warren,O.	R2 .....7.575
Weirton,W.Va.	W6 ....7.575
Youngstown	U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8)	A10 ....5.35
Warren,O.	R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind.	G6 .....7.425
Baltimore	T6 .....7.425
Boston	T6 .....7.975
Buffalo	S40 .....7.425
Cleveland	A7 .....7.425
Dearborn,Mich.	S3 ....7.425
Detroit	D2, M1, P20 ..7.425
Dover,O.	G6 .....7.425
Evanston,Ill.	M22 ....7.425
Farrell,Pa.	S3 .....7.425
Follansbee,W.Va.	W10 .7.425
Fontana,Calif.	K1 .....9.20
FranklinPark,Ill.	T6 ..7.425
Ind.Harbor,Ind.	Y1 ...7.425
Indianapolis	S41 .....7.575
LosAngeles	C1, S41 ....9.30
McKeesport,Pa.	E10 ...7.525
NewBedford,Mass.	R10 7.875
NewBritain,Conn.	S15 .7.875
NewCastle,Pa.	B4, M23.7.425
NewHaven,Conn.	D2 ..7.875
NewKensington,Pa.	A6.7.425
Pawtucket,R.I.	R3, N8.7.975
Philadelphia	P24 .....7.875
Riverdale,Ill.	A1 .....7.425
RiverRouge,Mich.	P16..7.425
Rome,N.Y.(32)	R6 ....7.425
Sharon,Pa.	S3 .....7.425
Trenton,N.J.(31)	R5 ..8.875
Warren,O.	R2, T5 ....7.425
Worcester,Mass.	A7 ....7.975
Youngstown	S41, Y1 ...7.425

STRIP, Cold-Rolled Alloy

Boston	T6 .....15.90
Carnegie,Pa.	S18 .....15.55
Cleveland	A7 .....15.55
Dover,O.	G6 .....15.55
Farrell,Pa.	S3 .....15.55
FranklinPark,Ill.	T6 ..15.55
Harrison,N.J.	S18 .....15.55
Indianapolis	S41 .....15.70
LosAngeles	S41 .....17.75
Lowellville,O.	S3 .....15.55
Pawtucket,R.I.	S8 ....15.90
Riverdale,Ill.	A1 .....15.55
Sharon,Pa.	S3 .....15.55
Worcester,Mass.	A7 ...15.85
Youngstown	S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland	A7 .....10.80
Dearborn,Mich.	S3 ....10.80
Dover,O.	G6 .....10.80
Farrell,Pa.	S3 .....10.80
Ind.Harbor,Ind.	Y1 ...10.80
Sharon,Pa.	S3 .....10.80
Warren,O.	R2 .....10.80
Weirton,W.Va.	W6 ....10.80
Youngstown	Y1 .....10.80

STRIP, Galvanized (Continuous)

Farrell,Pa.	S3 .....7.50
Sharon,Pa.	S3 .....7.50

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Anderson,Ind. G6	9.10	....	....	....	....
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	9.05	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, M23	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N2	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
RiverRouge,Mich. P10	9.05	10.50	12.70	....	....
Rome,N.Y. R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	....	....	18.85	22.95	27.80
Buffalo W12	....	....	18.85	....	....
Fostoria,O. S1	....	....	19.05	22.15	....
FranklinPark,Ill. T6	....	....	19.20	23.30	28.15
Harrison,N.J. C18	....	....	18.85	22.95	27.80
NewYork W3	....	....	18.85	22.95	27.80
Palmer,Mass. W12	....	....	18.85	....	....
Trenton,N.J. R5	....	....	18.85	22.95	27.80
Worcester,Mass. A7, T6	....	....	18.85	22.95	27.80
Youngstown S41	....	....	19.20	23.30	28.15

STRIP, C.R., Electrogalvanized

Cleveland A7	.....4.425*
Dover,O. G6	.....7.425*
Evanston,Ill. M22	....7.525*
McKeesport,Pa. E10	...7.50*
NewCastle,Pa. M23	..7.425*
Riverdale,Ill. A1	.....7.425*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	...7.975
Youngstown S41	.....7.425*

*Plus galvanizing extras.

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	.....8.175

TIGHT COOPERAGE HOOP

Atlanta A11	.....5.825
Farrell,Pa. S3	.....5.525
Riverdale,Ill. A1	.....5.675
Sharon,Pa. S3	.....5.525
Youngstown U5	.....5.525

TIN MILL PRODUCTS

ELECTROLYTIC THIN TIN PLATE (¼ lb coating in coils)

	Basis Weight 45 lb	50 lb	55 lb	60 lb
Fairfield,Ala. T2	$6.10	$6.25	$6.40	$6.55
Fairless,Pa. U5	6.10	6.25	6.40	6.55
Gary,Ind. U5	6.10	6.25	6.40	6.55
IndianaHarbor,Ind. I-2	6.10	6.25	6.40	6.55
Irwin,Pa. U5	6.10	6.25	6.40	6.55
SparrowsPoint,Md. B2	6.10	6.25	6.40	6.55
Weirton,W.Va. W6	6.10	6.25	6.40	6.55

TIN PLATE, Electrolytic (100 lb basis wt)	0.25 lb Coating
Aliquippa,Pa. J5	$9.10
Fairfield,Ala. T2	9.10
Fairless,Pa. U5	9.10
Fontana,Calif. K1	9.75
Gary,Ind. U5	9.10
GraniteCity,Ill. G4	9.20
Ind.Harb.,Ind. I-2, Y1	9.10
Irvin,Pa. U5	9.10
Niles,O. R2	9.10
Pittsburg,Calif. C11	9.75
SparrowsPt.,Md. B2	9.10
Weirton,W.Va. W6	9.10
Yorkville,O. W10	9.10

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.20
Fairless,Pa. U5	8.20
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

ELECTRO. TIN-COATED SHEET (20-27 gage; per 100 lb)

IndianaHarb.,Ind. Y1	$7.90

(21-27 gage; per 100 lb)

Aliquippa,Pa. J5	$7.90
Niles,O. R2	7.90

TIN PLATE, HOT DIPPED COMMON COKE	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.40	10.65
Fairless,Pa. U5	10.40	10.65
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

HOLLOWARE ENAMELING (Black plate) (29 Gage)

Aliquippa,Pa. J5	.....7.85
Gary,Ind. U5	.....7.85
GraniteCity,Ill. G4	.....7.95
Ind.Harbor,Ind. Y1	....7.85
Irvin,Pa. U5	.....7.85
Yorkville,O. W10	.....7.85

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	.....	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	....	9.875*	11.70*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	.....	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	.....	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	.....	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	.....	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	.....	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	.....	....	11.70†	12.40	13.55	14.65

	Stator
Mansfield,O. E6	8.10
Vandergrift,Pa. U5	8.10
Warren,O. R2 (Locore)	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	.....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	.....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. §Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala.	R2 ...8.00
Aliquippa,Pa.	J5 .....8.00
Alton,Ill.	L1 .....8.20
Atlanta	A1 .....8.00
Bartonville,Ill.	K4 .....8.10
Buffalo	W12 .....8.00
Chicago	W13 .....8.00
Cleveland	A7, C20 ....8.00
Crawfordsville,Ind.	M8..8.10
Donora,Pa.	A7 .....8.00
Duluth	A7 .....8.00
Fairfield,Ala.	T2 .....8.00
Fostoria,O.(24)	S1 .....8.10
Houston	S5 .....8.25
Jacksonville,Fla.	M8 ...8.35
Johnstown,Pa.	B2 .....8.00
Joliet,Ill.	A7 .....8.00
KansasCity,Mo.	S5 .....8.25
Kokomo,Ind.	C16 .....8.10
LosAngeles	B3 .....8.95
Minnequa,Colo.	C10 ....8.25
Monessen,Pa.	P7, P16 ..8.00
N.Tonawanda	S47 .....8.00
Palmer,Mass.	W12 .....8.30
Pittsburg,Calif.	C11 ....8.95
Portsmouth,O.	P12 .....8.00
S.Chicago,Ill.	R2 .....8.00
S.SanFrancisco	C10 ....8.95
SparrowsPoint,Md.	B2 ..8.10
Sterling,Ill.(1)	N15 ....8.00
Sterling,Ill.	N15 .....8.10
Struthers,O.	Y1 .....8.00
Waukegan,Ill.	A7 .....8.00
Worcester,Mass.	A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O.	W8 .....8.00
Buffalo	S47 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill.	K4 ....12.65
Buffalo	W12 .....13.40
Cleveland	A7 .....12.65
Donora,Pa.	A7 .....12.65
Duluth	A7 .....12.65
Johnstown,Pa.(10)	B2 .12.65
KansasCity,Mo.	U3 ....12.90
LosAngeles(2)	B3 ....13.60
Minnequa,Colo.	C10 ..12.775
Monessen,Pa.	P7, P16 .12.65
Muncie,Ind.	I-7 .....13.60
NewHaven,Conn.	A7 ...12.95
Palmer,Mass.	W12 ....13.70
Pittsburg,Calif.	C11 ....13.45
Portsmouth,O.	P12 ....12.65
Roebling,N.J.	R5 .....12.95
SparrowsPt.,Md.(10)	B2 12.75
Struthers,O.	Y1 .....13.40
Trenton,N.J.	A7 .....12.95
Waukegan,Ill.	A7 ....12.65
Worcester,Mass.	A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa.	J5 .....9.75
Alton,Ill.	L1 .....9.95
Buffalo	W12 .....9.75
Cleveland	A7 .....9.75
Donora,Pa.	A7 .....9.75
Duluth	A7 .....9.75
Johnstown,Pa.	B2 .....9.75
KansasCity,Mo.	S5, U3.10.00
Kokomo,Ind.	C16 .....9.85
LosAngeles	B3 .....10.70
Minnequa,Colo.	C10 ....9.95
Monessen,Pa.	P7, P16 ..9.75
NewHaven,Conn.	A7 ...10.95
Palmer,Mass.	W12 ....10.05
Pittsburg,Calif.	C11 ..10.075
Portsmouth,O.	P12 ....9.75
Roebling,N.J.	R5 .....10.05
S.Chicago,Ill.	R2 .....9.75
S.SanFrancisco	C10 ..10.075
SparrowsPt.,Md.	B2 ....9.85
Struthers,O.	Y1 .....9.75
Trenton,N.J.	A7 .....10.05
Waukegan,Ill.	A7 .....9.75
Worcester,Mass.	A7 ...10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa.	J5 .....9.75
Alton,Ill.	L1 .....9.95
Bartonville,Ill.	K4 .....9.85
Buffalo	W12 .....9.75
Cleveland	A7 .....9.75
Donora,Pa.	A7 .....9.75
Duluth	A7 .....9.75
Fostoria,O.	S1 .....9.80
Johnstown,Pa.	B2 ....9.75
KansasCity,Mo.	S5, U3.10.00
LosAngeles	B3 .....10.20
Milbury,Mass.(12)	N6 .10.05
Minnequa,Colo.	C10 ....9.95
Monessen,Pa.	P7, P16 ..9.75
Muncie,Ind.	I-7 .....9.95
Palmer,Mass.	W12 ....10.05
Pittsburg,Calif.	C11 ...10.20
Portsmouth,O.	P12 ....9.75
Roebling,N.J.	R5 .....10.05
S.Chicago,Ill.	R2 .....9.75
S.SanFrancisco	C10 ...10.20
SparrowsPt.,Md.	B2 ....9.85
Struthers,O.	Y1 .....9.75
Trenton,N.J.	A7 .....10.05
Waukegan,Ill.	A7 .....9.75
Wor'ster,Mass.	A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill.	L1 .....16.50
Bartonville,Ill.	K4 .....16.40
Chicago	W13 .....16.30
Cleveland	A7 .....16.30
Crawfordsville,Ind.	M8..16.40
Fostoria,O.	S1 .....16.30
Houston	S5 .....16.55
Jacksonville,Fla.	M8 ...16.65
Johnstown,Pa.	B2 ....16.30
KansasCity,Mo.	S5 ....16.55
Kokomo,Ind.	C16 .....16.30
Minnequa,Colo.	C16 ...16.55
Monessen,Pa.	P16 ....16.30
Muncie,Ind.	I-7 .....16.50
Palmer,Mass.	W12 ....16.60
S.SanFrancisco	C10 ....17.15
Waukegan,Ill.	A7 .....16.30
Worcester,Mass.	A7,J6..16.60

ROPE WIRE	(A)
Bartonville,Ill.	K4 ....13.45
Buffalo	W12 .....13.45
Fostoria,O.	S41 .....13.45
Johnstown,Pa.	B2 ....13.45
Monessen,Pa.	P7 .....13.45
Muncie,Ind.	I-7 .....13.65
Palmer,Mass.	W12 ....13.75
Portsmouth,O.	P12 ....13.45
Roebling,N.J.	R5 .....13.75
St.Louis	L8 .....13.45
SparrowsPt.,Md.	B2 ...13.55
Struthers,O.	Y1 .....13.45
Worcester,Mass.	J4 ....13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Tire Bead

Bartonville,Ill. K4	....17.15
Monessen,Pa. P16	....17.15
Roebling,N.J. R5	.....17.65

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	.....12.35
Baltimore T6	.....12.65
Boston T6	.....12.65
Buffalo W12	.....12.35
Chicago W13	.....12.45
Cleveland A7	.....12.35
Crawfordsville,Ind. M8	.12.35
Dover,O. G6	.....12.35
Evanston,Ill. M22	....12.45
Farrell,Pa. S3	.....12.35
Fostoria,O. S1	.....12.35
FranklinPark,Ill. T6	..12.45
Kokomo,Ind. C16	.....12.35
Massillon,O. R8	.....12.35
Milwaukee C23	.....12.55
Monessen,Pa. P7, P16	..12.35
NewCastle,Pa. M23	...12.35
Palmer,Mass. W12	....12.65
Pawtucket,R.I. N8	....12.65
Philadelphia P24	.....12.65
Riverdale,Ill. A1	.....12.45
Rome,N.Y. R6	.....12.35
Sharon,Pa. S3	.....12.35
Trenton,N.J. R5	.....12.65
Warren,O. B9	.....12.35
Worcester,Mass. A7, T6	12.65

NAILS, Stock Sizes

	Col.
AlabamaCity,Ala. R2	...173
Aliquippa,Pa. J5	173
Atlanta A11	173
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	..175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	....$10.30

NAILS, Cut (100 lb kegs)

Wheeling,W.Va. W10	..$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	...175
Aliquippa,Pa. J5	173
Atlanta A11	173
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	..177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	178
Pittsburg,Calif. C11	194
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

TIE WIRE, Automatic Baler
(14½ Ga.) (per 97 lb net box)
Coil No. 3150

AlabamaCity,Ala. R2	..$8.78
Atlanta A11	.....10.36
Bartonville,Ill. K4	....8.88
Buffalo W12	.....10.26
Chicago W13	.....9.24
Crawfordsville,Ind. M8	..8.88
Donora,Pa. A7	.....8.78
Duluth A7	.....8.78
Fairfield,Ala. T2	.....8.78
Houston S5	.....9.02
Jacksonville,Fla. M8	..8.88
Johnstown,Pa. B2	.....8.78
Joliet,Ill. A7	.....8.78
KansasCity,Mo. S5	....9.02
Kokomo,Ind. C16	.....8.88
LosAngeles B3	.....9.20
Minnequa,Colo. C10	.....8.02
Pittsburg,Calif. C11	....9.20
S.Chicago,Ill. R2	.....8.78
S.SanFrancisco C10	....9.20
SparrowsPt.,Md. B2	....8.88
Sterling,Ill.(37) N15	....8.88

Coil No. 6500 Stand.
100 lb coil

AlabamaCity,Ala. R2	..$9.06
Atlanta A11	.....10.70
Bartonville,Ill. K4	.....9.16
Buffalo W12	.....10.60
Chicago W13	.....9.54
Crawfordsville,Ind. M8	..9.16
Donora,Pa. A7	.....9.06
Duluth A7	.....9.06
Fairfield,Ala. T2	.....9.06
Houston S5	.....9.30
Jacksonville,Fla. M8	..9.16
Johnstown,Pa. B2	.....9.06
Joliet,Ill. A7	.....9.06
KansasCity,Mo. S5	....9.30
Kokomo,Ind. C16	.....9.16
LosAngeles B3	.....9.50
Minnequa,Colo. C10	....9.30
Pittsburg,Calif. C11	....9.50
S.Chicago,Ill. R2	.....9.06
S.SanFrancisco C10	....9.50
SparrowsPt.,Md. B2	....9.16
Sterling,Ill.(37) N15	....9.16

Coil No. 6500 Interim
100 lb coil

AlabamaCity,Ala. R2	..$9.11
Atlanta A11	.....10.75
Bartonville,Ill. K4	.....9.21
Buffalo W12	.....10.65
Chicago W13	.....9.59
Crawfordsville,Ind. M8	..9.21
Donora,Pa. A7	.....9.11
Duluth A7	.....9.11
Fairfield,Ala. T2	.....9.11
Houston S5	.....9.35
Jacksonville,Fla. M8	...9.21
Johnstown,Pa. B2	.....9.11
Joliet,Ill. A7	.....9.11
KansasCity,Mo. S5	....9.35
Kokomo,Ind. C16	.....9.21
LosAngeles B3	.....9.55
Minnequa,Colo. C10	....9.35
Pittsburg,Calif. C11	....9.55
S.Chicago,Ill. R2	.....9.11
S.SanFrancisco C10	....9.55
SparrowsPt.,Md. B2	....9.21
Sterling,Ill.(37) N15	....9.21

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	...212
Atlanta A11	212
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	..214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	..193**
Aliquippa,Pa. J5	.....190§
Atlanta A11	.....197*
Bartonville,Ill. K4	199
Crawfordsville,Ind. M8	..198
Donora,Pa. A7	.....193†
Duluth A7	.....193†
Fairfield,Ala. T2	.....193†
Houston S5	.....198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	.....196§
Joliet,Ill. A7	.....193†
KansasCity,Mo. S5	....198**
Kokomo,Ind. C16	.....195†
Minnequa,Colo. C10	..198**
Monessen,Pa. P7	.....196§
Pittsburg,Calif. C11	...213†
S.Chicago,Ill. R2	.....193**
SparrowsPoint,Md. B2	..198§
Sterling,Ill.(7) N15	198

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	..17.85	19.65
Bartonville K4	..17.95	19.80
Chicago W13	....17.85	....
Cleveland A7	....17.85	....
Craw'sville M8	17.95	19.80‡‡
Fostoria,O. S1	..18.35	19.90†
Houston S5	....18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	..17.85	19.65§
Kan.City,Mo. S5	..18.10	....
Kokomo C16	...17.95	19.50†
Minnequa C10	..18.10	19.65**
P'lm'r,Mass. W12	19.10	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran.C10	18.20	19.75**
SparrowsPt. B2	17.95	19.75§
St'ling(37) N15	..17.95	19.80
Waukegan A7	...17.85	19.40†
Worcester A7	...18.15	....

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	..177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	...177

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	.....187**
Aliq'ppa,Pa.9-11½Ga.J5	190§
Atlanta A11	.....191*
Bartonville,Ill. K4	193
Crawfordsville,Ind. M8	..192
Donora,Pa. A7	.....187†
Duluth A7	.....187†
Fairfield,Ala. T2	.....187†
Houston S5	.....192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(42) B2	..190§
Joliet,Ill. A7	.....187†
KansasCity,Mo. S5	.....192**
Kokomo,Ind. C16	.....189†
Minnequa,Colo. C10	..192**
Pittsburg,Calif. C11	...210†
S.Chicago,Ill. R2	.....187**
Sterling,Ill. (7) N15	192

WIRE, Merchant Quality
6 to 8 gage

	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	....8.65	9.325§
Atlanta(48) A11	..9.00	9.75*
Bartonville(48) K4	9.10	9.85
Buffalo W12	....9.00	9.55†
Chicago W13	....9.00	9.55**
Cleveland A7	....9.00	....
CrawfordsvilleM8	9.10	9.80††
Donora,Pa. A7	..9.00	9.55†
Duluth A7	.....9.00	9.55†
Fairfield T2	.....9.00	9.55
Houston(48) S5	..9.25	9.80**
Jack'vill.,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	....9.00	9.55†
KansasCity(48) S5	9.25	9.80**
Kokomo(48) S16	..9.10	9.65†
LosAngeles B3	..9.95	10.625§
Minnequa C10	..9.25	9.80**
Monessen(48) P7	..8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	..9.95	10.50†
S.SanFran. C10	..9.95	10.50**
S.Chicago R2	....9.00	9.55**
Spar'wsPt.(48) B2	9.10	9.775§
St'ling(37)(48) N15	9.10	9.80
Struthers,O. Y1	..9.00	9.65‡
Worcester,Mass. A7	9.30	9.85†

Based on zinc prices of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.10c. **Subject to zinc equalization extras.

FASTENERS

SCREWS, NUTS, BOLTS

(Consumer discounts per cent off list prices, plain finishes. For less than full container quantities, add 25 per cent; attaching nuts to bolts in sizes ¼ in. through ⅝ in. diameter through 8 in. in length, price on application. Discounts are determined by the quantity of screws, nuts, and bolts ordered for one destination at one time.)

Base, one keg	.....43.00
20,000 lb or more	....53.00

SCREWS, SETSCREWS

Hex Screws and High Strength Hex Screws, through 1 in. x 12 in.:

Base, one keg	..... 43.00
20,000 lb or more	.. 53.00

Hex Screws 1⅛ in. diameter and larger: See net price schedule.

Fillister Head Screws, coarse thread:

Packages	.....+70.00
Bulk	.....+28.00

Flat Head Screws, coarse thread:

Packages	.....+100.00
Bulk	.....+52.00

Setscrews, Square Head, Cup-point, coarse thread:

Packages	.....+10.00
Bulk	..... 15.00

(Bulk discounts on fillister, flat head, and setscrews apply only to products ordered in these minimum quantities: ¼ in. through ⅝ in. diameter, 15,000 pieces; ¾ in. through ⅝ in. diameter, 5000 pieces; and ¾ in. through 1 in. diameter, 2000 pieces.)

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in. larger 12.85 7/16 in. and smaller by 6 in. and shorter, 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over.)

	Standard Diameter, Inches 1/4	5/16	3/8	7/16	1/2
Buffalo W12	$26.20	$38.50	$47.90	$61.30	$80.30
KansasCity,Mo. U3	26.20	38.50	47.90	61.30	80.30
Minnequa,Colo. C10	26.20	38.50	47.90	61.30	80.30
Pittsburg,Calif. C11	26.20	38.50	47.90	61.30	80.30
Roebling,N.J. R5	26.20	38.50	47.90	61.30	80.30
SparrowsPoint,Md. B2	26.20	38.50	47.90	61.30	80.30
St.Louis L8	26.20	38.50	47.90	61.30	80.30
Waukegan,Ill. A7	26.20	38.50	47.90	61.30	80.30

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.12
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2¼	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.725
Steelton,Pa. B2	5.75	5.65	....	....

TIE PLATES

Fairfield,Ala. T2	.....6.875
Gary,Ind. U5	.....6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	..6.875
Seattle B3	.....7.025
Steelton,Pa. B2	.....6.875
Torrance,Calif. C11	...7.025

JOINT BARS

Bessemer,Pa. U5	.....7.25
Fairfield,Ala. T2	.....7.25
Joliet,Ill. U5	.....7.25
Lackawanna,N.Y. B2	..7.25
Minnequa,Colo. C10	....7.25
Steelton,Pa. B2	.....7.25

AXLES

Ind.Harbor,Ind. S13	...9.125
Johnstown,Pa. B2	....9.125

SCREW SPIKES

Lebanon,Pa. B2	.....15.10

TRACK BOLTS, Untreated

Cleveland R2	.....15.35
KansasCity,Mo. S5	....15.35
Lebanon,Pa. B2	.....15.35
Minnequa,Colo. C10	...15.35
Pittsburgh S44	.....15.35
Seattle B3	.....15.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	....10.10
Ind.Harbor,Ind. I-2, Y1	10.10
KansasCity,Mo. S5	....10.10
Lebanon,Pa. B2	.....10.10
Minnequa,Colo. C10	...10.10
Pittsburgh J5	.....10.10
Seattle B3	.....10.60
S.Chicago,Ill. R2	.....10.10
Struthers,O. Y1	.....10.10
Youngstown R2	.....10.10

FOOTNOTES

(1) Chicago base.
(2) Double galvanized.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Limited analyses only.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Bethany A coating.
(12) Worcester, Mass., base.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(38) 14 Ga., 48 in.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter 60" & narrower.
(39) 48" and narrower.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds and 2½ in. and smaller hexagons; 9.625c for larger rounds and hexagons and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	2.5	+26	+10.5	+36	+21.5	+46	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.75		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.25	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.75	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on price of zinc at 11.50c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	41.50	43.50	39.25	48.50	43.50
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	46.75
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	45.00
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	49.50
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	29.50	39.50	40.50	44.25	46.75	42.25	52.00	49.50
304L	....	37.25	47.25	48.25	52.00	54.50	50.00	59.75	57.25
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.75	75.75	71.75	80.75	76.75
316L	....	55.25	72.25	76.25	79.50	83.50	79.50	88.50	84.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	62.25
330	....	....	123.25	....	98.75	143.75	135.00	149.25	149.25
18-8 Cb-Ta	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	75.25
403	....	....	26.75	....	29.75	31.50	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	26.75	31.00	29.75	31.50	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	38.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	42.00
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; Branford Machine & Mfg. Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Elwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Phoenix Steel Corp.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Somers Brass Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels, Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Corp.; Vanadium-Alloy Steel Co., Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates, Carbon Base 5%	10%	15%	20%	Sheets, Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	49.80	61.35	72.80	84.40	....
Nickel	43.20	55.05	66.95	78.90	....
Nickel, Low Carbon	43.50	55.70	67.95	80.35	....
Monel	44.25	55.35	66.45	77.60	....

	Strip, Carbon Base, Cold Rolled 10%	Both Sides
Copper*	36.10	43.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. P4; Coatesville, Pa. L7; New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Claymont, Del. P4; Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	Hi-Carbon-Cr (D-11)	0.955
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W-Cr Hot Work (H-12)	0.530
V-Cr Hot Work (H-11)	0.505	W Hot Wk (H-21)	1.425-1.44

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

Prices in dollars per gross ton, f.o.b. (rail) furnace; add 50 cents when shipped by truck. Maximum delivered prices are approximate and based on rail shipment.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	66.50	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
NorthTonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	78.11	78.61	79.11	....
Rochester, N.Y., deld.	69.87	70.37	70.87	....
Syracuse, N.Y., deld.	71.22	71.72	72.22	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
SouthChicago, Ill. R2	66.00	66.50	66.50	67.00
SouthChicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.81	69.31	69.31	69.81
Muskegon, Mich., deld.	....	74.46	74.46	....
Cleveland District				
Cleveland A7, R2	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	Nom.	Nom.	Nom.	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.41	75.91	....
Newark, N.J., deld.	72.53	73.03	73.53	74.03
Philadelphia, deld.	70.18	70.68	71.18	71.68
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Boston, deld.	75.20	75.70	76.20	76.70
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), deld.	....	68.31	68.31	68.81
Monaca, Pa., deld.	....	68.33	68.33	68.83
Lawrenceville, W. Homestead, Wilmerding, Pa., deld.	....	68.68	68.68	69.18
Verona, Trafford, Pa., deld.	68.83	69.33	69.33	69.83
Brackenridge, Pa., deld.	69.16	69.66	69.66	70.16
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	...	....	66.50	....
Other U. S. Districts				
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	62.00	62.50‡	66.50	67.00
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....
Mansfield, Ohio, deld.	....	....	71.34	....
Canadian District				
Hamilton, Ont. S46	65.00	65.00	65.50	....
PortColborne, Ont. A25	65.00	65.00	65.50	66.00
SaultSte. Marie, Ont. A25	65.00	65.00	65.50	66.00

*Phos. 0.70-0.90%; Phos. 0.30-0.60%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%. Foundry grade, 1.75% or under, deduct 50c.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 13%; starting with silicon over 13% add $1 per ton for each 0.50% silicon or portion thereof up to 14%; over 14%, price is $93 with $1 differential; add $1 for each 0.50% Mn over 1%)

Buffalo H1	$79.25
Jackson, Ohio I-3, J1	78.00
PortColborne, Ont. A25	78.50
Toledo, Ohio I-3	78.00

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.45% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry, K2	89.00
Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, K2	92.00

LOW PHOSPHORUS IRON, Gross Ton

Birdsboro, Pa. B10 (Phos. 0.075% max)	$73.00
Lyles, Tenn. T3 (Phos. 0.035% max)	73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Buffalo H1 (Intermediate) (0.036-0.075% max)	71.50
Chicago I-3 (Phos. 0.075% max)	71.00
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Phos. 0.075% max)	71.00
Erie, Pa. I-3 (Phos. 0.075% max)	71.00
NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Swedeland, Pa. A3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Troy, N.Y. R2 (Phos. 0.075% max)	73.00

Steel Service Center Products

Representative prices, cents per pound, f.o.b. warehouse, for 2000 lb orders. Prices will vary with total weight of the order. City delivery charges are 15 cents per 100 lb except: Denver, 20 cents; Baltimore, Boston, New York, Philadelphia, San Francisco, 10 cents; Atlanta, Birmingham, Dallas, Houston, Los Angeles, Seattle, no charge.

	SHEETS			STRIP	BARS			STRUCTURAL	PLATES	
	Hot Rolled	Cold Rolled	Galv.	Hot Rolled	H.R. Rounds	C.F. Rounds	H.R. Alloy 4140	SHAPES	Carbon	Floor
Atlanta	9.37	10.61	11.85	10.85	9.53	13.24	....	9.94	9.73	11.16
Baltimore	9.50	10.26	10.06	11.25	9.65	11.70	16.38	9.85	9.60	11.10
Birmingham	8.46	10.20	10.59	9.45	8.26	13.14	16.65	8.47	8.41	10.05
Boston	9.90	10.40	11.52	12.40	10.05	13.35	16.59	10.50	9.83	11.85
Buffalo	9.30	10.05	11.80	11.70	9.45	11.45	16.30	9.90	9.40	11.80
Charlotte, N. C.	9.95	11.22	10.55	11.35	10.00	12.68	....	10.20	9.95	11.75
Chicago	9.22	10.20	10.13	11.39	9.22	10.65	15.95	9.57	9.06	11.35
Cincinnati	9.38	10.26	10.18	11.71	9.33	11.53	16.27	10.14	9.44	11.68
Cleveland	9.22	10.66	10.92	11.51	9.33	11.25	16.06	9.96	9.30	11.59
Dallas	9.07	9.88	11.75	10.63	8.48	12.98	16.95	8.71	8.31	9.68
Detroit	9.48	10.46	10.50	11.76	9.53	11.01	16.23	10.14	9.43	11.61
Denver	9.41	11.77	12.11	9.86	10.10	11.47	....	10.02	9.69	11.83
Houston	8.67	9.48	11.35	10.23	8.08	13.10	16.55	8.31	8.00	9.28
Indianapolis	9.66	10.64	10.57	11.83	9.66	11.09	16.39	10.01	9.50	11.79
Kansas City	9.21	10.87	11.35	10.87	9.31	11.57	15.72	9.80	9.10	....
Los Angeles	10.35	11.20	12.10	12.40	10.25	14.20	17.35	10.45	10.30	12.30
Memphis, Tenn.	9.63	10.35	10.80	11.29	9.48	12.70	16.53	9.67	9.32	11.18
Milwaukee	9.36	10.34	10.27	11.53	9.36	10.89	16.09	9.79	9.20	11.49
Moline, Ill.	9 57	10.55	10.48	11.74	9.57	11.00	16.30	9.92	9.41	11.70
Newark, N. J.	9.81	10.34	11.35	11.37	10.05	13.25	16.40	10.35	9.04	11.82
New York	9.81	10.34	11.35	11.37	10.05	13.25	16.40	10.35	9.04	11.82
Philadelphia	9.50	10.00	10.66	11.25	9.65	11.95	16.38	9.85	9.60	11.10
Pittsburgh	9 22	10.53	11.68	11.49	9.22	11.25	15.95	9.57	9.06	11.35
Portland, Oreg.	10 40	12.25	12.35	12.40	10.40	16.65	17.85	11.00	10.55	12.70
St. Louis	9.42	10.58	10.51	11.59	9.44	11.28	16.33	9.80	9.28	11.59
St. Paul	8.82	9.49	10.64	10.99	8.82	11.49	16.54	9.17	8.66	10.95
San Francisco	10.65	11.65	11.75	12.70	10.55	15.10	17.25	11.10	10.80	12.95
Seattle	11.35	12.45	13.40	12.80	10.80	16.20	17.85	11.50	10.95	13.60
Spokane, Wash.	11.20	12.30	13.25	12.65	10.65	16.05	17.70	11.35	10.80	13.45

Specifications: Hot rolled sheet, sheared edge, 10 Ga. & 36 x 96-120 in.; cold rolled sheets, 20 Ga. & 36 x 96-120 in.; galvanized sheets, 10 Ga. x 36 x 120 in. except Los Angeles, Dallas and Houston, 10 Ga. x 48 x 120 in.; hot rolled strip, ⅛ in. x 1 in.; hot rolled carbon bars, rounds, ⅝ in.—1¼ in., M1020; cold finished bars, 1 in., C1018; hot rolled alloy bars, 4140 annealed, 1⅝ in.—2⅞ in. rounds; structural shapes, I beams, 6 x 12½ in.; carbon plate, sheared, through ½ in. x 84 in.; floor plates, ¼ in. x 36 in.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hitchins, Olive Hill, Ky., Athens, Troup, Tex., Clearfield, Curwensville, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., Frostburg, Md., $133; Templeton, Pa., $135; Salina, Pa., $138; Niles, Ohio, $139; Lehi, Utah, $175.

Super-Duty: Ironton, Ohio, St. Louis, Mexico, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Frostburg, Md., $200; Stevens Pottery, Ga., $210; Troup, Tex., $215; Lehi, Utah, $263.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Hawstone, Thompsontown, Pa., Ensley, Ala., Portsmouth, Ohio, St. Louis, $158; Warren, Niles, Windham, Ohio, $163; E. Chicago, Ind., Joliet, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $133; Philadelphia, Clearfield, Pa., $138; Warren, Ohio, $148.

Ladle Brick (per 1000 pieces*)

Dry-Pressed: Alsey, Ill., Johnstown, Pa., Vandalia, Mo., $97; Chester, New Cumberland, W. Va., Freeport, Vanport, Merrill Station, Clearfield, Pa., Wellsville, Irondale, New Salisbury, Ohio, $100; Portsmouth, Ohio, $102; St. Louis, Mexico, Mo., $120; Lehi, Utah, $175.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $250; Danville, Ill., $253; Fords, N. J., Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., Frostburg, Md., $260; Troup, Tex., $265.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., Frostburg, Md., $320; Troup, Tex., Fords, N. J., Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., Frostburg, Md., $360; Troup, Tex., Fords, N. J., Philadelphia, $365.

Tar Bonded Brick (per ton)

Dolomite: Narlo, Ohio, $87.50. Dolomite-Magnesite: Hays, Pa., Hammond, Ind., $107; Narlo, Ohio, $109.50. Magnesite: Narlo, Ohio, $128; Hays, Pa., Hammond, Ind., $130.

Sleeves (per 1000)

St. Louis, $193; Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310; Reesdale, Pa., $355.

Runners (per 1000)

Johnstown, Bridgeburg, St. Charles, Clearfield, Pa., $234; Reesdale, Pa., $245.

Dolomite (per ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines, Chewelah, Wash., $46; minus ⅝ in. grains bulk, Luning, Nev., $46; ⅝ in. grains with fines (periclase), Baltimore, $73, Pascagoula, Miss., $90.

*—9 in. x 4½ x 2.50 straights.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5½	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Canadian Steel

(Cents pel lb, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:

Carbon (N.T.):	
Forging	$97.00
Rerolling	78.00
Alloy (N.T.)	115.00
Wire Rods:	
Carbon	5.70
Alloy	6.40
Wire (carload lots):	
Merchant annealed	8.40
Low carbon indus.	7.20
Upholstery spring	8.55
M.B. spring	8.85

Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted.)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.50
100 mesh, pails	9.85‡
40 mesh bags	7.50††
Electrolytic Iron,	
Melting stock, 99.9% Fe, irreg. fragments, ⅛ in. x 1.3 in.	27.75
(In contract lots of 750 tons price is 22.75c)	
Annealed, 99.5% Fe...36.75, ton deld. east of Mississippi.	
Unannealed (99+% Fe)	33.0
Unannealed (99+% Fe) (minus 325 mesh)	58.0
Carbonyl Iron: 90-99.9%, 3 to 20 microns, depending on grade, 88.00-700.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 600-lb drum freight allowed, c.l. 42.80; ton lots	41.80
Brass, 80/20, leaded (60 mesh)	37.80
Bronze powder, 90-10	56.80
Copper, all types	15.06*
Lead	7.50*
Manganese, 500 lb and up	25.00*
Nickel, all types	0.78-1.06
Nickel-Silver	56.00
Solder	7.00*
Stainless Steel, 304	89.00
Stainless Steel, 316	$1.07
Steel, AISI 4600	32.00
Tin	14.00*
Zinc	23.20
Cobalt:	Dollars
98.5%, minus 100-300 mesh	1.57-1.58
99.5% below 5 microns	2.32
Molybdenum	4.35

*Plus cost of metal. ‡Depending on mesh. §Cutting and scarfing grades. **Depending on price of ore. ††Welding grade.

Imported Steel

Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. (Source of shipment: Western Continental Europe.)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.15	....	$5.10	$5.00	$5.30
Bar Size Angles	5.15	....	5.10	5.00	5.30
Structural Angles	5.05	....	5.00	4.90	5.20
I-Beams	5.05	....	5.00	4.90	5.20
Channels	5.15	....	5.10	5.00	5.30
Plates (basic bessemer)	5.30	....	5.25	5.15	5.45
Sheets, hot rolled and galvanized	Nom.	....	Nom.	Nom.	Nom.
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	24.16	....	24.09	23.81	25.54
Barbed Wire (†)	6.25	....	6.20	6.10	6.40
Merchant Bars	5.15	....	5.10	5.00	5.30
Hot-Rolled Bands	5.65	....	5.60	5.50	5.80
Wire Rods, Thomas No. 5 (Niederrhein)	5.80*	....	5.75	5.75	6.00
Wire Rods, O.H., No. 5 (Niederrhein)	6.00*	....	5.95	5.95	6.20
Bright Common Wire Nails (‡)	7.15	....	7.10	7.00	7.30
(Source of Shipment: Japan)					
Wire, galvanized	$8.62	....	$8.62	$8.62	$8.57
Wire, bright	7.60	....	7.60	7.60	7.55
Wire Rods, O.H. No. 5 (Sumitomo)	5.80	....	5.80	5.75	6.00
Strand, stress relieved (Sumitomo)					
⅜ in. diam, 1000 lineal ft	39.90	....	39.90	39.90	39.50
7/16 in. diam, 1000 lineal ft	53.50	....	53.50	53.50	53.00
Bright common wire nails	7.15	....	7.15	7.15	7.15

†Per 82 lb net reel. ‡Per 100 lb keg, 20d and heavier. *Except Boston.

Ores

Lake Superior Iron Ore

(Prices effective for the 1961 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi nonbessemer	$11.45
Mesabi bessemer	11.60
Old Range nonbessemer	11.70
Old Range bessemer	11.85
Open-hearth lump	12.70
High phos.	11.45

Based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1961; increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

New Jersey, concentrates ..... nom.

Foreign Iron Ore

Cents per unit

Swedish basic, 65%, c.i.f. Atlantic ports	25.00†
Chilean, 62-65%, c.i.f. Atlantic ports	22.00
Brazilian (lump), 68.5%, f.o.b. vessel, Victoria, per ton	$11.50

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$14.75-15.00*
Domestic, concentrates, f.o.b. milling points	22.00-23.00

Manganese Ore

Mn 46-48%, Indian, 82.00-85.00c nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$34.00-35.00†
48% no ratio	25.00-26.00†

South African Transvaal

44% no ratio	18.75
48% no ratio	24.00-26.00†

Turkish

48% 3:1	35.00-37.00†

Domestic

Rail nearest seller

18% 3:1	30.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked $1.40

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

60% min	$4.15-4.40
65% min	4.50-4.75

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

*Before duty. †Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Chattanooga, Tenn., ovens	30.80
Detroit, ovens	32.00
Pontiac, Mich., deld.	34.05
Saginaw, Mich., deld.	35.63
Erie, Pa., ovens	32.00
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.64
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
New Haven, Conn., ovens	31.00
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.45
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.78
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	34.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg.	6.00
Toluene, one deg. (deld. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per ton bulk, f.o.b. cars or trucks, plant.	
Ammonium sulfate, regular grade	$32.00

'62 Farm Equipment Sales May Hold at '61 Level

Initial production schedules for 1962 are based on expectations for a good year at Deere & Co., Moline, Ill. The company believes next year's sales (farm and industrial tractors and equipment) will be about the same as this year's.

William A. Hewitt, president, says cash receipts of farmers in the U. S. are expected to set a record in 1961, and preliminary estimates for 1962 indicate next year's may be as high or higher.

Wire . . .

Wire Prices, Pages 142 & 143

Drawn wire shipments are expected to amount to around 2.3 million net tons in 1961, about equal to last year's total. Fasteners and the automotive industry account for the largest tonnages.

Wire specialty needs, in some cases, are slightly ahead of 1960 volume in New England. Some producers are averaging close to 70 per cent of capacity for the year.

Competition from imports, including rods, has been keenest in the lower carbon grades. Swedish volume has held its place in the high carbon category.

Shipments are prompt on all grades, but they could be improved if the wire mills were willing to schedule production involving overtime and other higher costs. At current prices, most mills refuse to increase costs even under the threat of losing an order.

American Steel & Wire Div., Cleveland, U. S. Steel Corp., has been awarded a contract for 195 tons of carbon drawn wire by the Military Industrial Supply Agency, Navy, Philadelphia.

Pig Iron . . .

Pig Iron Prices, Page 145

Some Spanish iron is moving in the Philadelphia area at around $8 to $9 a ton under the domestic market.

Blast furnace production in October amounted to 6,387,521 tons compared with 6,071,375 tons in September, reports the American Iron & Steel Institute. Included in the October output were 57,907 tons of ferromanganese and spiegeleisen; in the ten-month total, 440,513 tons.

Foundries are buying iron cautiously, keeping inventories in check as the yearend approaches. They are able to get prompt shipments to cover unexpected requirements and to replace tonnages consumed.

Steel mills are using a fairly high ratio of hot metal in their open hearth melts, cutting down their needs for scrap. With demand for merchant iron limited, steel mills are channeling less pig iron output than usual into the merchant market.

The lake movement of pig iron from the Buffalo area will soon be coming to a close. Late season shipments are being made out of that port to western points of consumption.

Structural Shapes . . .

Structural Shape Prices, Page 140

Structural steel bookings and shipments may reach the best levels of the year in December. Demand for wide flange beams isn't as strong in the Pittsburgh area as it is in the West, but it's picking up. Deliveries are good. For the most part, the mills are operating on regular cycles.

Construction is slowing down seasonally, but there's substantial tonnage on fabricators' books, assuring activity well into the winter. The only segment of the market that's really disappointing is railroad carbuilding, and it has been poor all year.

Settlement of the structural iron workers strike in Northern Ohio has permitted resumption of activity on more than 125 projects that had been held up. Work will be rushed as long as the weather permits. In the East, Irvington Steel & Iron Works, New Brunswick, N. J., reports it has had to add a second shift to keep up with new orders.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

8385 tons, state highway work, FAVWE 61-3, Queens County, New York, through Johnson, Drake & Piper, general contractor, to Ernst Steel Co., Buffalo.

5200 tons, bridge, Fire Island-Jones Beach, Long Island, N. Y., through Karl Koch Erecting Co., general contractor, to Ft. Pitt Bridge Works, Pittsburgh.

4000 tons, University Teaching Hospital, Syracuse, N. Y., through Malan Construction Corp., New York, to Levinson Steel Co., Pittsburgh.

2900 tons, 21 story office building, Rose Associates, 1180 Sixth Ave., New York, to Schacht Steel Construction Inc., Hillside, N. J.

2460 tons, state highway, PSC 10324, Nassau County, New York, through Hendrickson Bros. Inc., general contractor, to Ingalls Iron Works, Birmingham, Ala.

1250 tons, addition, building No. 59, Hoffman-La Roche Inc., Nutley, N. J., through Wigton-Abbott Corp., contractor, to Bethlehem Contracting Co., Bethlehem, Pa.

1020 tons, high school, Locust Valley, Long Island, N. Y., through D. Fortunati Inc., general contractor, to Bethlehem Fabricators, Bethlehem, Pa.

900 tons, headquarters facilities, Great River, Long Island, N. Y., through Crow, Lewis & Wick, to Bethlehem Fabricators, Bethlehem, Pa.

800 tons, manufacturing building, Rowe Mfg. Co., Whippany, N. J., through Engineers Inc., Newark, N. J., to Schacht Steel Construction Inc., Hillside, N. J.

STRUCTURAL STEEL PENDING

4117 tons, state bridgework, Route 80, Section 5R, Saddle Brook, N. J., bids closed Nov. 22.

4000 tons, state highway work, FIWE 61-2, Queens County, New York, A. E. Ottaviano, low on general contract.

3028 tons, including 833 tons low alloy, six span bridge, Interstate Route 84, Hartford, Conn.; also, 757 tons of concrete reinforcing bars and 734 tons of steel piling.

2820 tons, state bridgework, FAGCT 61-5, FIHHE 61-2, Queens County, New York, pending.

2770 tons, state bridgework, FADWE 61-4, Queens County, New York, Grow Construction Co., general contractor.

1648 tons, state bridgework, FARC 61-30, Queens County, New York, Gull Contracting Co. Inc., general contractor.

1500 tons, Oregon State, John Day River bridge; bids to Salem, Oreg., Dec. 6.

1200 tons, state bridgework, FISH 61-15, FARAE 61-1, FARC 61-83, Monroe County, New York, S. J. Rose, Syracuse, N. Y., general contractor.

1000 tons, municipal assembly center, Tulsa, Okla., bids closed Nov. 21.

1000 tons, addition, Meadow Brook Hospital, East Meadow Brook, N. Y.; pending.

905 tons, state bridgework, FISCH 61-20, Saratoga County, New York, Kiewit & Sons Co., Syracuse, N. Y., general contractor.

800 tons or more, federal office building, Richland, Wash.; bids soon.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Argentina, seventy, 1200 hp, diesel electric locomotives, to the Montreal Locomotive Works, Montreal, Que.

Santa Fe, eight, 2500 hp, diesel electric locomotives to the General Electric Co., Schenectady, N. Y.

RAILROAD CARS PLACED

Seaboard Air Line, 1100 freight cars: 500, seventy ton steel boxcars to Pullman-Standard Div., Pullman Inc., Chicago; 100, ninety ton, covered hoppercars—95 to the Magor Car Corp., Passaic, N. J., and five to the American Car & Foundry Div., ACF Industries Inc., New York; and 300, seventy ton, open top hoppercars and 200, seventy ton, steel, wood-chip cars to the Greenville Steel Car Co., Greenville, Pa. The Seaboard is also inquiring for 150, seventy ton hoppercars.

Atlantic Coast Line, 700 boxcars, divided equally between the Bessemer, Ala., plant of the Pullman-Standard Div., Chicago, Pullman Inc., and the St. Louis plant of the American Car & Foundry Div., New York, ACF Industries Inc. The road expects to place orders shortly for 300 phosphate hoppercars.

Illinois Central, 100, seventy ton covered hoppercars, to Pullman-Standard Div., Chicago, Pullman Inc.

Western Pacific, ten, 100 ton stainless steel hoppercars to Thrall Car Mfg. Co., Chicago Heights, Ill.

Southern Railways, forty seven, 30,000 gallon tankcars, to American Car & Foundry Div., New York, ACF Industries Inc.

RAILROAD CARS PENDING

Department of Interior, Bureau of Mines, Amarillo, Tex., 25 tankcars for the transport of compressed helium; bids Dec. 11.

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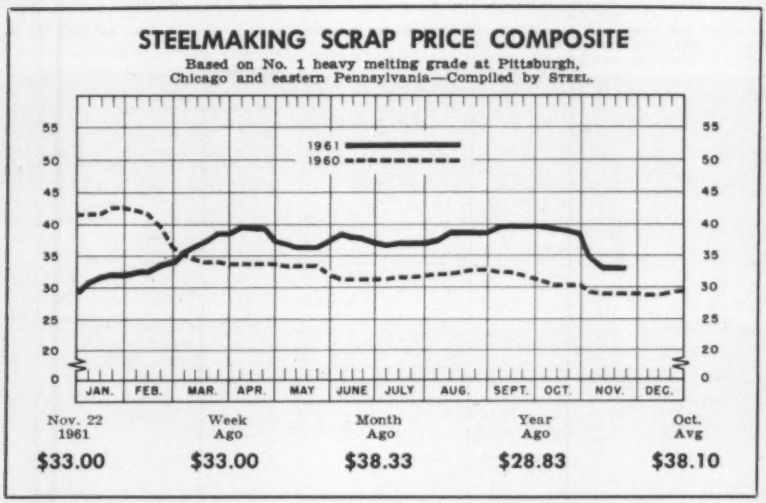

Scrap Price Trend Uncertain

Market appears to be steady at most centers following recent sharp reductions, but outlook is blurred by lagging domestic and export demand

Scrap Prices, Page 150

● **Chicago**—The market is moving sidewise. Prices are nominal, but they lack a thorough test. Auto stamping plant offerings of No. 1 factory bundles for December delivery hold the key to prices over coming weeks. Steelmaking operations continue upward, but weekly gains are small, and a dip is expected in December.

● **Philadelphia** — Buying continues restricted, and prices have declined on some grades. Couplers, springs, and wheels are lower at $40, delivered, rail crops (2 ft and under) are $48-$49, No. 1 cupola $39, and drop broken machinery $48. Prices continue soft on the major open hearth grades, but are unchanged.

● **New York**—Brokers' buying prices are unchanged, but the tone of the market is soft, with little domestic buying and export trading still tapering.

● **Detroit**—A Canadian order is in the market for No. 1 heavy melting steel at $27 a ton on track. No busheling is beiug accepted. Other orders are lacking. Dealers are trying to unload stocks for yearend tax purposes. Foreign scrap buying is at a virtual standstill as the shipping season draws to a close.

● **Cleveland**—Holiday sluggishness is adding to the lethargy of the district scrap market. Traders anticipate little activity until bids on December auto industrial lists are closed at monthend. Yard accumulations are reported growing in the Valley where yard operators have cut down on the intake of peddler scrap.

● **Pittsburgh**—Prices on the low phos grades are weak, but no change is noted elsewhere in the list. Traders predict the market's trend will be sidewise for the rest of this year. Major consumers aren't likely to buy until their operations climb above 85 per cent of capacity. The district ingot rate in the week ended Nov. 18 was about 69 per cent of 1960 capacity.

● **Buffalo**—Prices on most grades of steelmaking scrap fell $1 a ton last week due to the absence of mill demand. With exports at low ebb and little out-of-district business in sight, dealers have little hope to move tonnage immediately. Some marketmen feel local prices may dip further since little mill buying is expected before January. Prices on cast iron scrap also declined $1 a ton, reflecting new foundry orders.

● **Cincinnati**—Scrapmen think the market is bumping bottom. Prices are unchanged. They expect a large area steel mill to enter the dealer market shortly for substantial tonnage. It has not been buying for several months. The strong steel rate in the district is providing market support.

● **St. Louis**—Not much change is expected in this market over the rest of the year. Buyers are showing little interest in material. Some traders think prices are now leveling off, largely because material is no longer being offered the mills at bargain levels.

● **Birmingham**—Prices are holding, but there is little buying to provide a test. One dealer reported that for the first time in 15 years the local market on cast iron scrap was quoted under prices prevailing in the Northeast. Dealers and brokers are not optimistic, but, in general, they expect no further price reductions the rest of this year.

● **Houston**—Major consumers are out of the market, and suppliers are pessimistic. One exporter says Japanese demand may not revive for six to eight months. Texas mill buying is expected to be limited through January. Mexican mills are waiting for lower prices before placing orders.

● **Seattle**—Uncertainty prevails in the market following the recent sharp price decline. Quotations are nominal, but lack a test. Dealers are awaiting developments in the export market.

● **Los Angeles** — With the scrap movement down to a trickle, some dealers are cutting their prices in an effort to stimulate buying. Demand for the No. 2 grades is particularly weak. With one exception (No. 1 heavy melting steel) dealers' yard supplies are heavy.

● **San Francisco**—Traders think it will be difficult to hold prices at present levels the rest of this year because exports are lagging and domestic demand is sluggish.

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Nov. 22, 1961. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Nov. 22	$33.00
Nov. 15	33.00
Oct. Avg.	38.10
Nov. 1960	28.83
Nov. 1956	61.83

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	26.00-27.00
No. 1 dealer bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	33.00-34.00
No. 1 factory bundles	39.00-40.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	13.00-14.00
Shovel turnings	18.00-19.00
Cast iron borings	17.00-18.00
Cut structurals:	
2 ft and under	*39.00-40.00*
3 ft and under	*36.00-37.00*
Heavy turnings	31.00-32.00
Punchings & plate scrap	*41.00-42.00*
Electric furnace bundles	40.00-41.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	32.00-33.00
Stove plate	32.00-33.00
Unstripped motor blocks	23.00-24.00
Clean auto cast	33.00-34.00
Drop broken machinery	44.00-45.00‡

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Random rails	*45.00-46.00*
Angles, splice bars	43.00-44.00
Railroad specialties	44.00-45.00
Rails, rerolling	58.00-59.00

Stainless Steel Scrap

18-8 bundles & solids	190.00-195.00
18-8 turnings	115.00-120.00
430 bundles & solids	90.00-95.00
410 turnings	55.00-60.00

CHICAGO

No. 1 hvy melt., indus.	32.00-33.00
No. 1 hvy melt., dealer	30.00-31.00
No. 2 hvy melting	27.00-28.00
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	31.00-32.00
No. 2 bundles	22.00-23.00
No. 1 busheling, indus.	32.00-33.00
No. 1 busheling, dealer	30.00-31.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	17.00-18.00
Shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Cut structurals, 3 ft	38.00-39.00
Punchings & plate scrap	40.00-41.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	33.00-34.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	44.00-45.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
R.R. malleable	44.00-45.00
Rails, 2 ft and under	48.00-49.00
Rails, 18 in. and under	50.00-51.00
Angles, splice bars	42.00-43.00
Axles	54.00-55.00
Rails, rerolling	57.00-58.00

Stainless Steel Scrap

18-8 bundles, solids	165.00-170.00
18-8 turnings	95.00-100.00
430 bundles & solids	80.00-85.00
430 turnings	45.00-50.00

BUFFALO

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	23.00-24.00
No. 1 busheling	*28.00-29.00*
Shovel turnings	17.00-18.00
Machine shop turnings	12.00-13.00
Cast iron borings	15.00-16.00
Low phos. structurals and plates, 2 ft and under	*36.00-37.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*37.00-38.00*
No. 1 machinery	*44.00-45.00*

Railroad Scrap

Rails, random lengths	*39.00-40.00*
Rails, 3 ft and under	*45.00-46.00*
Railroad specialties	*38.00-39.00*
Rails, rerolling	60.00-61.00

CLEVELAND

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	22.00-23.00
No. 1 factory bundles	37.00-38.00
No. 1 bundles	31.00-32.00
No. 2 bundles	19.00-20.00
No. 1 busheling	31.00-32.00
Machine shop turnings	15.00-16.00
Shovel turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut foundry steel	32.00-33.00
Cut structurals, plate 2 ft and under	36.00-37.00
Low phos. punchings & plate	32.00-33.00
Alloy free, short shovel turnings	20.00-21.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	26.00-27.00
Heavy breakable cast	26.00-27.00
Stove plate	34.00-35.00
Unstripped motor blocks	27.00-28.00
Brake shoes	37.00-38.00
Clean auto cast	39.00-40.00
Burnt cast	30.00-31.00
Drop broken machinery	45.00-46.00

Railroad Scrap

R.R. malleable	48.00-49.00
Rails, 2 ft and under	46.00-47.00
Rails, random lengths	43.00-44.00
Rails, 18 in. and under	48.00-49.00
Cast steel	37.00-38.00
No. 1 railroad cast	44.00-45.00
Railroad specialties	41.00-42.00
Angles, splice bars	40.00-41.00
Rails, rerolling	50.00-51.00

Stainless Steel Scrap (Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	155.00-160.00
18-8 turnings	85.00-90.00
430 clips, bundles, solids	80.00-85.00
430 turnings	15.00-25.00†

YOUNGSTOWN

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	23.00-24.00†
No. 1 busheling	34.00-35.00
No. 1 bundles	34.00-35.00
No. 2 bundles	21.00-22.00
Machine shop turnings	15.00-16.00
Shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	35.00-36.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.50-32.50
No. 2 heavy melting	25.00-26.00
No. 1 bundles	32.50-33.50
No. 2 bundles	18.00-19.00
No. 1 busheling	31.50-32.50
Machine shop turnings	8.00-9.00
Mixed borings, turnings	11.00-12.00
Shovel turnings	13.00-14.00
Cast iron borings	13.00-14.00
Low phos., 18 in.	40.00-41.00

Cast Iron Grades

No. 1 cupola	33.00-34.00
Heavy breakable cast	29.00-30.00
Charging box cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	41.00-42.00

DETROIT (Brokers' buying prices)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	20.00-21.00
No. 1 bundles	29.00-30.00
No. 2 bundles	21.00-22.00
No. 1 busheling	*26.00-27.00*
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Shovel turnings	11.00-12.00

Cast Iron Grades

No. 1 cupola	30.00-31.00
Mixed cast	28.00-29.00
Heavy breakable	24.00-25.00
Unstripped motor blocks	20.00-21.00
Clean auto cast	37.00-38.00

Stainless Steel Scrap

18-8 bundles & solids	165.00-170.00
18-8 turnings	70.00-75.00
430 bundles & solids	65.00-70.00

PHILADELPHIA

No. 1 heavy melting	34.00
No. 2 heavy melting	28.00
No. 1 bundles	36.00
No. 2 bundles	23.00
No. 1 busheling	36.00
Electric furnace bundles	38.00
Mixed borings, turnings	16.00†
Shovel turnings	20.00
Machine shop turnings	13.00†
Heavy turnings	24.00†
Structurals & plates	38.00-39.00
Couplers, spring, wheels	*40.00*
Rail crops, 2 ft & under	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	*39.00*
Heavy breakable cast	39.00
Drop broken machinery	*48.00*
Malleable	48.00†

NEW YORK (Brokers' buying prices)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	22.00-23.00
No. 1 bundles	27.00-28.00
No. 2 bundles	19.00-20.00
Machine shop turnings	4.50-5.00†
Mixed borings, turnings	5.00-5.50†
Shovel turnings	6.00-7.00†
Low phos. structurals & plates	34.00-35.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	32.00-33.00

Stainless Steel

18-8 sheets, clips, solids	145.00-150.00
18-8 borings, turnings	70.00
410 sheets, clips, solids	40.00-45.00
430 sheets, clips, solids	55.00-60.00

BOSTON

(Brokers' prices; f.o.b. shipping point)

No. 1 heavy melting	28.50-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 1 busheling	28.50-29.00
Machine shop turnings	5.00-6.00
Shovel turnings	9.00-9.50
No. 1 cast	39.00-40.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	40.00-42.00

ST. LOUIS (Brokers' buying prices)

No. 1 heavy melting	31.00
No. 2 heavy melting	26.00
No. 1 bundles	32.00
No. 2 bundles	*21.00*
No. 1 busheling	32.00
Machine shop turnings	13.50
Shovel turnings	15.50

Cast Iron Grades

No. 1 cupola	*34.00*
Charging box cast	33.00
Heavy breakable cast	32.00
Unstripped motor blocks	33.00
Clean auto cast	37.00
Stove plate	30.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00*
Rails, random lengths	*38.00*
Rails, rerolling	*53.00*
Rails, 18 in. and under	43.00
Railroad specialties	*38.00*
Angles, splice bars	38.00

BIRMINGHAM

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	33.00-34.00
No. 2 bundles	20.00-21.00
No. 1 busheling	36.00-37.00
Cast iron borings	9.00-10.00
Machine shop turnings	16.00-17.00
Shovel turnings	18.00-19.00
Bar crops and plate	41.00-42.00
Structurals & plate	40.00-41.00
Electric furnace bundles	36.00-37.00
Electric furnace:	
3 ft and under	34.00-35.00
2 ft and under	35.00-36.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	38.00-39.00
Unstripped motor blocks	29.00-30.00
No. 1 wheels	33.00-34.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, rerolling	46.00-47.00
Rails, 2 ft and under	44.00-45.00
Rails, random lengths	40.00-41.00
Angles, splice bars	42.00-43.00

HOUSTON

(Brokers' buying prices; f.o.b. car)

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	32.00-33.00
No. 1 bundles	38.00-39.00
No. 2 bundles	24.00-25.00
Machine shop turnings	12.50-13.00
Crushed turnings	18.00-19.00
Low phos. plate & structurals:	
3 ft	41.00-42.00
2 ft and under	45.00-46.00

Cast Iron Grades

No. 1 cupola	*38.00-39.00*
Heavy breakable	*24.00-25.00*
Foundry malleable	*28.00-29.00*
Unstripped motor blocks	*29.00-30.00*

Railroad Scrap

R.R. heavy melt (3 ft)	38.00

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	*32.00*
No. 1 bundles	*27.00-29.00*
No. 2 bundles	22.00-23.00
No. 2 bundles (export)	23.00-24.00
Machine shop turnings	*13.00-14.00*
Shovel turnings	*13.00-14.00*
Cast iron borings	*13.00-14.00*
Electric furnace scrap	*45.00-50.00*

Cast Iron Grades

No. 1 cupola	*45.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00

PORTLAND, OREG.

(Prepared, f.o.b. car)

No. 1 heavy melting	48.00
No. 2 heavy melting	41.00
No. 2 bundles	26.00
Shovel turnings	18.00
Electric furnace	49.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable	35.00
Unstripped motor blocks	33.00
Stove plate (f.o.b. plant)	33.00

SEATTLE (Prepared, f.o.b. car)

No. 1 heavy melting	46.00
No. 1 hvy (unprepared)	41.00
No. 2 heavy melting	41.00
No. 2 hvy (unprepared)	37.00
No. 2 bundles	26.00
Shovel turnings	16.00
Electric furnace	49.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	35.00
Stove plate	33.00
Unstripped motor blocks	33.00

SAN FRANCISCO

No. 1 heavy melting	38.00**
No. 2 heavy melting	33.00**
No. 1 bundles	27.00**
No. 2 bundles	23.00**
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Shovel turnings	15.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	45.00-46.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	*27.00*
No. 2 hvy melt, 2 ft & under	*26.00*
No. 1 bundles	*28.00*
No. 2 bundles	*21.50*
Mixed steel scrap	*19.00*
Mixed borings, turnings	12.00
Busheling, new factory:	
Prepared	*27.00*
Unprepared	*21.00*
Shovel turnings	12.00

Cast Iron Grades‡

No. 1 machinery cast	32.00

**Based mainly on export sales.
†Nominal.
‡F.o.b. Hamilton, Ont.
§Delivered.

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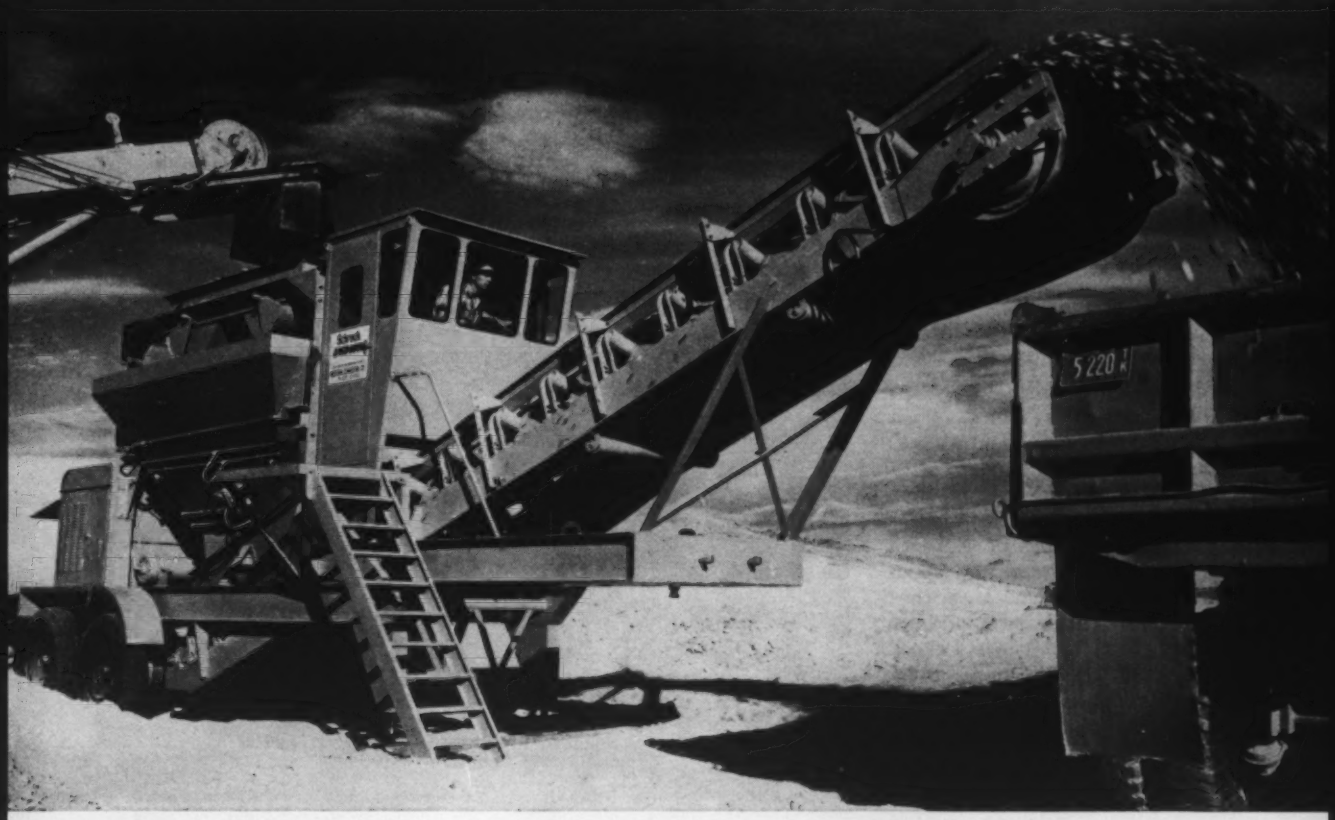
Now **you can get USS "T-1" Steels from Steel Service Centers coast to coast**

New portable weigher and loader eliminates the ordinary truck delays for separate weighing. Hopper parts subjected to severe abrasion are made of USS "T-1" Steel.



USS "T-1" Steel in portable weigher hoppers increases service life 65%... reduces weight 50%

There is something new under the sun in Boise, Idaho. A portable weigher, called the Shrock Speed-Weigh, holds promise of revolutionizing bulk-materials weighing. This unit, designed by the Western Conveyor Company, will weigh and discharge a six-ton load from hopper to truck in 10 seconds. It will handle rock, gravel, coal, iron ore and other aggregate materials.

One of the big problems the designers faced was finding a type of steel that would permit reduction in weight, for mobility, yet be tough enough to take extreme abrasive punishment. U. S. Steel was asked to help. Tests proved that USS "T-1" Constructional Alloy Steel would solve the problem.

To assure long maintenance-free operation in spite of high tonnages and extremely abrasive conditions, parts of the surge-hopper, the weigh-hopper and the gates were lined with ¼" plates of USS "T-1" Steel. A total of 2,188 pounds of "T-1" Steel was used for these applications resulting in a weight saving of 50%. Liner life was increased by 65%. In addition to the "T-1" Steel used, 14,680 pounds of USS structurals, angles, channels, sheets, plates and bars go into each bulk weigher also.

Other equipment where USS "T-1" Steel saves money. For power shovel and dragline buckets, scrapers, bulldozers, truck liners, equipment haulers—wherever extra high strength is needed with impact abrasion resistance and weldability—USS "T-1" Steel results in longer life and freedom from breakdowns. USS "T-1" Steel and the new lower priced "T-1" type A Steel can be furnished to a minimum yield strength of 100,000 psi, or a minimum hardness of 321 Brinell, depending on application. USS "T-1" Steel can also be furnished to 360 Brinell. All of these tough, weldable steels can reduce weight and increase the strength and life of your equipment. Call your local Steel Service Center for more information. Or, for the name of the distributor of USS "T-1" Steels nearest you, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS and "T-1" are registered trademarks.

United States Steel Corporation • Columbia-Geneva Steel Division • National Tube Division • Tennessee Coal and Iron Division • United States Steel Export Company

USS **United States Steel**

Asarco's new mine means . . .

More Cushion for Copper Users

Nonferrous Metal Prices, Pages 154 & 155

U. S. COPPER CAPACITY got a healthy boost this month when American Smelting & Refining Co. officially commenced production at its Mission mine near Tucson, Ariz.

Opening of the facility means 45,000 additional tons of copper a year. U. S. capacity is now about 1.2 million tons a year. U. S. consumption in a high level business year would run in the neighborhood of 1.5 million to 1.6 million tons, so we are still a copper short nation.

• **Significance**—Construction of the Mission mine, which was discovered only a few years ago, was completed in a little under two years—six months ahead of schedule. Original cost was estimated at $43.5 million; actual cost turned out to be only $34 million. Asarco now obtains more than half its copper output from its own mines, enhancing its position as a primary producer rather than a custom smelter. The mine also tends to disprove the notion that we are rapidly becoming a have not nation in mineral wealth.

The open pit mining operation (see picture) will cover an area ½ by 1 mile when the mine is fully developed. Copper content of the ore runs up to 0.9 per cent. Annual output of the mine will be about 165,000 tons of copper ore concentrate, which will be shipped to Asarco smelters and refineries for conversion into commercial copper. Preliminary reports indicate a 15 year reserve of the copper bearing ore; reserve estimates will undoubtedly be upgraded as more ore is mined.

Byproduct metals aren't being extracted from the Mission ore. But company officials say that some molybdenum may eventually be obtained.

When in full operation, the new mine is expected to provide jobs for 400 persons.

Better Year for Aluminum

The nation's aluminum distributors, who saw business decline almost 10 per cent in 1960, will show a 12 per cent sales increase this year and perhaps a 15 to 20 per cent rise in 1962. The prediction was made by Alfred T. Fortier, president of Reynolds Aluminum Supply Co. ,of California and the National Association of Aluminum Distributors (NAAD), at the group's 11th annual meeting in Phoenix, Ariz.

Last year, sales of aluminum distributors were around 198,000 tons, or about 16 per cent of the aluminum industry's shipments of distributor-type products. This year, sales should hit 228,000 tons, or 17.1 per cent. In the near future, distributors could capture as much as 35 per cent of this market, believe industry people.

Mr. Fortier makes these 1961 forecasts for the aluminum industry:

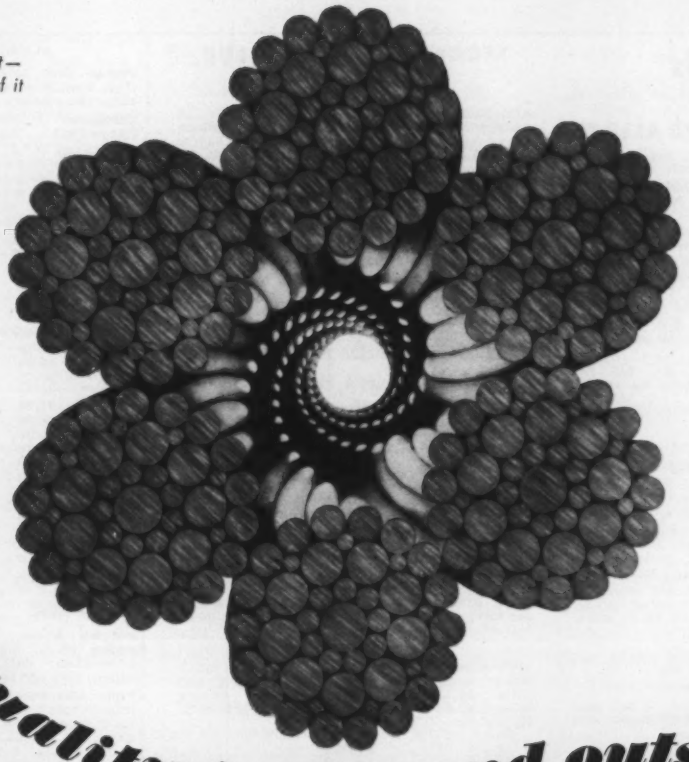
• Shipments will reach 2.4 million tons, 3 per cent above last year's.

• Domestic shipments will rise 10 per cent, from 2 million tons to 2.25 million tons.

• Exports will be off sharply, from 300,000 tons last year to 150,000 tons in 1961.

• Domestic consumption will total about 2.2 million tons, up 5 per cent from last year's 2,118,000 tons.

We put a lot of work into it—
You get a lot of work out of it



quality inside and outside

Two important angles on wire rope savings: the *quality* and *uniformity* Roebling builds all the way through Royal Blue Wire Rope. They give you a big, extra margin of service through every kind of wear and tear — and combine to make extra strong Roebling Royal Blue the toughest wire rope you can buy. Find out more from your wire rope distributor, or write for free booklet to Roebling's Wire Rope Division, Trenton 2, N. J.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corp.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, 30 and 50 lb ingots, 24.00, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 25.20; No. 43, 25.30; No. 195, 26.70; No. 214, 28.10; No. 356, 26.00, 30 and 50 lb ingots.

Antimony: R.M.M. brand, 95.5%, 32.50; Lone Star brand, 33.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 30.50-31.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $70.00 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $65 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 99+%, $1.50 per lb for 500-lb keg; $1.52 per lb for 100 lb case; $1.57 per lb under 100 lb.

Columbium: Powder, $40 per lb and up nom.

Copper: Electrolytic, 31.00 deld; custom smelters, 31.00 nom; lake, 31.00 deld; fire refined, 30.75.

Germanium: Purified, ingots, less than 1 kg 37.50 per gram; 1-10 kg 32.00 per gram; 10 kg or more, 29.95 per gram; intrinsic grade, under 10 kg, 31.95 per gram; 10 kg or more, 29.95 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-75 per troy oz nom.

Lead: Common, 9.80; chemical, 9.90; corroding, 9.90; St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 24 lb, $11 per lb deld; 24-99 lb, $9.50; 100-449 lb, $9.25; 450 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex., 1.3 in. diam. x 12 in. sticks, 57.00 f.o.b. Madison, Ill.

Magnesium Alloy: AZ91A (diecasting), 40.75; AZ63A, AZ92A, AZ91C (sand casting), 40.75 f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $188-191 per 76 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-8.5 in. diam., 50-4999 lb, $8.15 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, briquettes, sheets (4 x 4 in. and larger), unpacked, 81.25; 10-lb pig, unpacked, 89.00; "XX" nickel shot, 88.75; "F" nickel shot for addition to cast iron, in kegs, 81.75; "F" nickel, 5 lb ingots, 82.75. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.09. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 77.50.

Osmium: $70-90 per troy oz nom.

Palladium: $24-26 per troy oz.

Platinum: $82-85 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $137-140 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $6.50 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; 5 and 12 lb bricks, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom; sheet, $55 per lb nom.

Tellurium: $5.25 per lb, 100 lb or more.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 123.25; prompt, 122.875.

Titanium: Sponge, 99.3+% grade A-1, ductile (0.3% Fe max), $1.37 per lb; grade A-2 (0.5% Fe max), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 100-lb lots, $2.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00c; 99+% hydrogen reduced, $3.25.

Zinc: Prime Western, 11.50; brass special 11.70; intermediate, 11.70, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.35; special high grade, 12.50 deld. Diecasting alloy ingot No. 3, 13.75; No. 2, 14.25; No. 5, 14.00 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7.25-7.75 per lb; 100-500 lb, $6.75-7.25 per lb; 500-1000 lb, $6.25-6.75; over 1000 lb, $6.25 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.00; No. 12 foundry alloy (No. 2 grade), 21.25; 5% silicon alloy, 0.60 Cu max, 23.00; 13 alloy, 0.60 Cu max, 23.00; 195 alloy, 24.25; 108 alloy, 21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.75; grade 2, 21.50; grade 3, 20.50; grade 4, 19.50.

Brass Ingot: Red brass, No. 115, 32.00; tin bronze, No. 225, 41.25; No. 245, 35.75; high leaded tin bronze, No. 305, 36.00; No. 1 yellow, No. 405, 27.50; manganese bronze, No. 421, 31.25.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.25; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.98, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.98, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.35; l.c.l., 36.98. Weatherproof 20,000-lb lots, 37.05; l.c.l., 37.80.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $15.50 per cwt; pipe, full coils, $15.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $5.70-15.50; sheared mill plate, $4.45-9.00; wire, $5.00-9.50; forging billets, $3.00-4.75; hot-rolled and forged bars, $3.39-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 28.00; ribbon zinc in coils, 22.50; plates, 21.50.

ZIRCONIUM

Plate, $11.00-16.00; H.R. strip, $11.00-15.00; C.R. strip, $13.00-18.00; forged or H.R. bars, $11.00-15.00.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	147	126	145
Strip, C.R.	133	114	145
Plate, H.R.	134	116	133
Rod, Shapes, H.R.	116	95	116
Seamless Tubes	157	129	200

ALUMINUM

(Selected products and sizes)

Flat Sheets: 1100, 3003, and 5005, mill finish.

Thickness Range (in.)	Width (in.)	Length Range (in.)	Price Range
0.250-0.183	24-72	72-180	44.40-47.00
0.183-0.154	24-72	72-180	44.40-47.00
0.154-0.120	24-72	72-180	44.90-47.80
0.120-0.096	24-72	72-180	44.90-47.80
0.096-0.076	24-72	72-180	45.40-49.30
0.076-0.060	24-72	72-180	45.90-50.10
0.060-0.047	24-72	72-180	46.40-51.30
0.047-0.037	24-72	72-180	46.90-52.70
0.037-0.030	24-72	72-180	47.40-54.30
0.030-0.023	24-60	72-180	47.90-56.10
0.023-0.018	24-48	72-144	48.40-56.40
0.018-0.014	24-48	72-144	50.20-57.00
0.014-0.011	24-48	72-144	52.50-59.00
0.011-0.0085	24-36	72-96	55.20
0.0085-0.007	24-36	72-96	58.20
0.007-0.006	24-36	72-96	61.00

ALUMINUM (continued)

Plates: 1100, 3003, and 5005, mill finish, O, H12, and H14 tempers, 30,000 lb base f.o.b. customer custody.

Thickness Range (in.)	Width (in.)	Length Range (in.)	Price Range
3.000-2.000	6-144	72-240	45.10-50.00
2.000-1.251	6-144	72-240	45.50-50.30
1.251-0.751	6-144	72-240	44.50-49.60
0.751-0.250	6-144	72-240	44.50-49.60

Screw Machine Stock: 30,000 base, 12 ft lengths.

Diam (in.)*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	74.90	76.30	....	....
0.188	63.20	62.20	....	79.10
0.250	60.00	61.60	72.70	73.10
0.375	59.20	62.80	71.00	71.00
	2011-T3	2017-T451	2011-T3	2017-T451
0.500	59.20	62.80	71.00	71.00
0.625	59.20	62.80	67.80	66.90
0.750	57.70	61.00	61.60	62.80
0.875	57.70	61.00	61.60	62.80
1.000	57.70	61.00	61.60	62.80
1.125	55.30	58.50	59.50	60.50
1.375	55.30	58.50	59.50	60.50
1.500	55.30	58.50	59.50	60.50
1.625	53.00	55.70	....	58.30
1.750	53.00	55.70	58.30	58.30
1.875	53.00	55.70	....	58.30
2.000	53.00	55.70	58.30	58.30
2.250	51.50	54.00	....	58.30
2.500	51.50	54.00	....	58.30
2.750	49.90	52.20	....	58.30
3.000	49.00	52.20	....	58.30
3.250	....	52.20	....	....
3.375	...	52.20	....	....

Selected sizes.

Forging Stock: Rounds, Class 1, random length, diam., 0.375-8 in., "F" temper; 2014, 45.50-55.60; 6061, 41.50-55.60; 7075, 56.50-64.60; 7079, 58.50-66.60.

Pipe: ASA schedule 40, alloy 6063-T6, 3-40 ft lengths, plain ends, 90,000 lb base, dollars per ft. Nominal pipe sizes, 1 in., 32.00; 1¼ in., 43.40; 1½ in., 51.80; 2 in., 62.60; 3 in., 124.95; 4 in., 171.80; 5 in., 233.15; 6 in., 308.55; 8 in., 484.35; 10 in., 716.25 (3-24 ft lengths).

Extruded Solid Shapes

Factor	Alloy 6063-T5	Alloy 6062-T6
1-14	45.30-46.80	54.00-60.00
15-17	45.30-46.80	56.50-61.80
18-23	45.80-47.50	58.60-67.00
24-32	45.80-47.50	66.80-81.50
33-38	49.50-52.20	85.10-96.60
39-44	59.80-63.60	102.00-124.00

MAGNESIUM

Sheets and Plates: AZ31B standard grades, .032 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.00 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in. 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. width: .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.00 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grades (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-68.40	90.60-91.30
36-38	71.50-75.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 23.25-23.75; No. 2 heavy copper and wire, 21.50-22.00; light copper, 18.75-19.25; No. 1 composition red brass, 20.50-21.00; No. 1

BRASS MILL PRICES

MILL PRODUCTS a

(Copper or Copper Alloy No.)	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes
Copper (110)	56.13b	50.36-51.36	....	57.32
Yellow Brass (268, 270)	49.27	35.77c	49.56	53.43
Low Brass, 80% (240)	52.15	52.09	52.44	56.21
Red Brass, 85% (230)	53.17	53.11	53.46	57.23
Com. Bronze, 90% (220)	54.73	54.67	55.02	58.54
Manganese Bronze (675)	57.69	51.27	61.54	....
Munts Metal (365)	51.94	47.25	....	....
Naval Brass (464)	53.94	47.75	60.25	58.10
Silicon Brass (651)	61.39	60.58	60.68	79.80
Nickel Silver, 10% (745)	65.56	67.16	66.91	....
Phos. Bronze, A-5% (510)	76.97	77.47	76.72	78.90

SCRAP ALLOWANCES d (Based on copper at 31.00c)

Clean Heavy	Rod Ends	Clean Turnings
27.00	27.00	26.25
20.375	19.50c	18.50c
22.875	22.625	22.125
23.875	23.625	23.125
24.75	24.50	24.00
19.25	19.00	18.50
19.125	18.875	18.375
19.00	18.75	18.25
26.50	26.25	25.75
26.00	25.75	13.00
28.50	28.25	27.25

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Free cutting. d. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time of any or all kinds of scrap, add 1 cent per lb.

composition turnings, 19.50-20.00; new brass clippings, 15.00-15.50; light brass, 12.00-12.50; heavy yellow brass, 13.00-13.50; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 16.50-17.00; cocks and faucets, 17.00-17.50; brass pipe, 15.00-15.50.

Lead: Soft scrap lead, 6.75-7.00; battery plates, 2.50-2.75; linotype and stereotype, 8.00-8.50; electrotype, 7.50-7.75; mixed babbitt, 10.00-10.50.

Monel: Clippings, 26.00-26.50; old sheets, 25.00-25.50; turnings, 18.50-19.00; rods, 25.00-25.50.

Nickel: Sheets and clips, 56.00-58.00; rolled anodes, 56.00-58.00; turnings, 43.00; rod ends, 56.00-58.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 8.00-8.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 10.00-10.50; segregated high copper clips, 9.00-9.50; mixed low copper clips, 9.50-10.00; mixed high copper clips, 9.00-9.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 8.50-9.00; clean borings and turnings, 7.00-7.50; segregated low copper clips, 14.00-14.50; segregated high copper clips, 12.50-13.50; mixed low copper clips, 12.00-13.00; mixed high copper clips, 11.00-12.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 9.75; clean borings and turnings, 8.50; segregated low copper clips, 13.00; segregated high copper clips, 12.25; mixed low copper clips, 12.50; mixed high copper clips, 12.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.00; light scrap, 52.00; turnings and borings, 37.00.

Copper and Brass: No. 1 heavy copper and wire, 26.75; No. 2 heavy copper and wire, 24.75; light copper, 22.50; refinery brass (60% copper) dry copper content, 23.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.75; No. 2 heavy copper and wire, 24.75; light copper, 22.50; No. 1 composition borings, 23.50; No. 1 composition solids, 24.00; heavy yellow brass solids, 24.50; yellow brass turnings, 15.50; radiators, 20.00.

Plating Material

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.60.

Copper: Flat-rolled, 47.50; oval, 44.50; electrodeposited, 37.50; cast, 42.50, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 500 lb, 117.50; 500-1999 lb, 110.50; 2000-4999 lb, 107.00; 5000-29,999 lb, 106.00; 30,000 lb, 105.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 142.50; 200-499 lb, 141.00; 500-999 lb, 140.50; 1000 lb or more, 140.00.

Zinc: Balls, 18.25; flat tops, 18.25; flats, 21.00; ovals, 20.85, ton lots.

CHEMICALS

Cadmium Oxide: $1.60 per lb in 100-lb drums.

Chrome Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.5; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cynide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,000 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.50; 2000-5900 lb, 13.50; 6000-11,900 lb, 13.25; 12,000-22,900 lb, 13.00; 23,000 lb or more, 12.50.

Nickel-Chloride: 100 lb, 47.50; 200 lb, 45.50; 300 lb, 44.50; 500-4900 lb, 42.50; 500-9900 lb, 40.50; 10,000 lb or more, 39.50.

Nickel Sulphate: 5000-22,999 lb, 31.00; 23,000-39,900 bl, 30.50; 40,000 lb or more, 30.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-900 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 90.10; 100-600 lb, 80.40; 700-1900 lb, 77.70; 2000-9990 lb, 75.80; 10,000 lb or more, 74.50.

Stannous Chloride (Anhydrous): 100 lb, 149.70; 400 lb, 139.70; 800-19,000 lb, 118.40; 20,000 lb or more, 114.20.

Stannous Sulphate: Less than 50 lb, 156.90; 50 lb, 126.90; 100-1900 lb, 124.90; 2000 lb or more, 122.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 141 & 142

Demand for hot and cold rolled sheets has improved. Some larger buyers in particular—such as those identified with the automotive and appliance industries—are placing orders for shipment farther in advance. Some are formulating programs for the first half of next year, with due allowance for the building of inventories as a hedge against a possible strike in the steel industry next summer. The smaller consumers continue to buy hand to mouth.

Mill delivery promises show little change, with hot rolled sheets available within two to three weeks and cold rolled within two to five weeks. Most producers are out of the market on galvanized for December shipment. Also, they have little electrical sheet and enameling stock available for delivery this year.

Pittsburgh area mills say November shipments will be on a par with October's and may even be a shade higher. Producers are forecasting a gain of 5 to 10 per cent for December that will make that month the best for the year from a shipping standpoint.

Automakers have outlined inventory building programs that will push their stocks up to at least a three month level by next June. Ford Motor Co. expects by May 31 to have its normal inventory (a 21 day supply) plus all the steel it will need for June, July, August, and September production. About half its requirements will come from its own plant. The Rouge mill would not be shut down if the United Steelworkers went out on strike because it's organized by the United Auto Workers.

Although automakers are more alert than other customers in the matter of inventory planning, appliance manufacturers aren't far behind.

Steelmakers have worked out arrangements with auto companies and other big customers that will permit them to reach their inventory objectives. At the same time, they have tried to assure lesser buyers an equitable share by keeping automobile orders within the framework of a reservation system. They'll try to maintain 45 day leadtime on sheets. Since they'll know in advance what customers' requirements are going to be, they'll hold tonnage for them until expiration of the 45 day period. As the market tightens, customers will probably be encouraged to place their orders 60 days before the start of the month in which they expect delivery.

Southline Metal Products Co., Houston, Tex., has a supplemental contract for 62,500 steel drums (55 gallon capacity). Exteriors of the drums will be enameled. The contract involves $438,438.

Distributors . . .

Prices, Page 145

Sales this month by steel service centers are running 2 to 3 per cent below those in October on a daily basis. It is likely that the month's total will wind up in about the same fashion.

Distributors have a husky inventory of practically all steel products and are trying to maintain the present level. An inventory buildup in anticipation of increased business in the first quarter has not been started in any serious way.

Service center products which have improved most since mid-October are plates, structural shapes, and bars. Also encouraging is the fact that recent orders have included some from automakers.

Bookings by distributors for 1961 are expected to be a little larger than those in 1960. The present sales level is the highest for the year to date. A gain of up to 10 per cent is anticipated for 1962.

Western Washington steel distributors and consumers will present

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WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind.
Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

STEEL PRESIDENT reports:

Soffel's EXOTHERMIC SIDEBOARDS

"increase production and lower overall costs. Profits reflect the superiority of this method of pouring alloy and all grades of steel."

Yes, experience in pouring hundreds of heats of steel using Soffel's Exothermic Sideboards in the heads of Big End Down molds shows significant benefits are derived. First, increased ingot yield of sound top cut steel; second, lower labor costs at the pouring platform and in reduced track time; third; increased slab yield; fourth, more out the door product.

You'll be happier with your profit picture when you see the results of using Soffel's Exothermic Sideboards in your melting operations.

Give them a fair trial soon.

PRODUCT ADVANTAGES

- **Eliminate permanent and conventional hot tops.**
- **Easy, and single, stripping of Big End Down molds.**
- **Sideboards are easily placed in head of mold by one man — crane only necessary on very large ingots.**
- **Longer mold life — less mold cost — less mold inventory to carry.**

Soffel's Exothermic Sideboards increase ingot yield, assure top cut soundness and provide more ton steel out the door per ton of steel in the ingot.

Phone NAtional 5-1571

Pittsburgh Metals Purifying Co.

A Division of Treesdale Laboratories, Inc.

MARS, PENNSYLVANIA

their arguments for a rate parity on steel products at a hearing in Seattle Nov. 29. They are asking the same rail freight rates from Geneva, Utah, now applying to California, Portland, Oreg., and Spokane, Wash.

It is claimed by the group, headed by H. E. Stack, Stack Steel & Supply Co., Seattle, that the Puget Sound territory is under a handicap of $2.20 a ton. It is asserted that the rate disparity places Puget Sound steel distributors and users under a sizable handicap. It also effects shipments from this area to Alaska and elsewhere.

The arguments will be made at a joint meeting of the North Pacific Coast Freight Bureau and the Pacific Southcoast Freight Bureau, the two representing the seven Western railroads.

Canadian Service Centers Report Sales Pickup

October tonnage was better than that of the same month last year, said 60 per cent of the steel service centers responding in a survey by the Canadian Steel Warehouse Association. The average improvement was about 19 per cent, but in a few instances increases of 80 and 90 per cent were reported.

At the same time, 13 per cent of the respondents reported that October, 1961, volume was about the same as it was in October, 1960. Another 27 per cent advised that their October tonnage was down; decreases ranged from 2 to 30 per cent. Some of the declines were due to strikes in the construction industry.

Comparing October and September sales, 52 per cent of the respondents reported gains of 14 per cent; 39 per cent reported average decreases of 13 per cent; 9 per cent estimated their sales were about even with those in the preceding month.

The majority of the distributors said prices were firmer.

Two-thirds of the service centers reported lower inventories, with mill deliveries extended in some lines and customer pressure for fast delivery service increasing. In some instances, the service centers have enlarged their labor forces.

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COMING DEC. 4

in

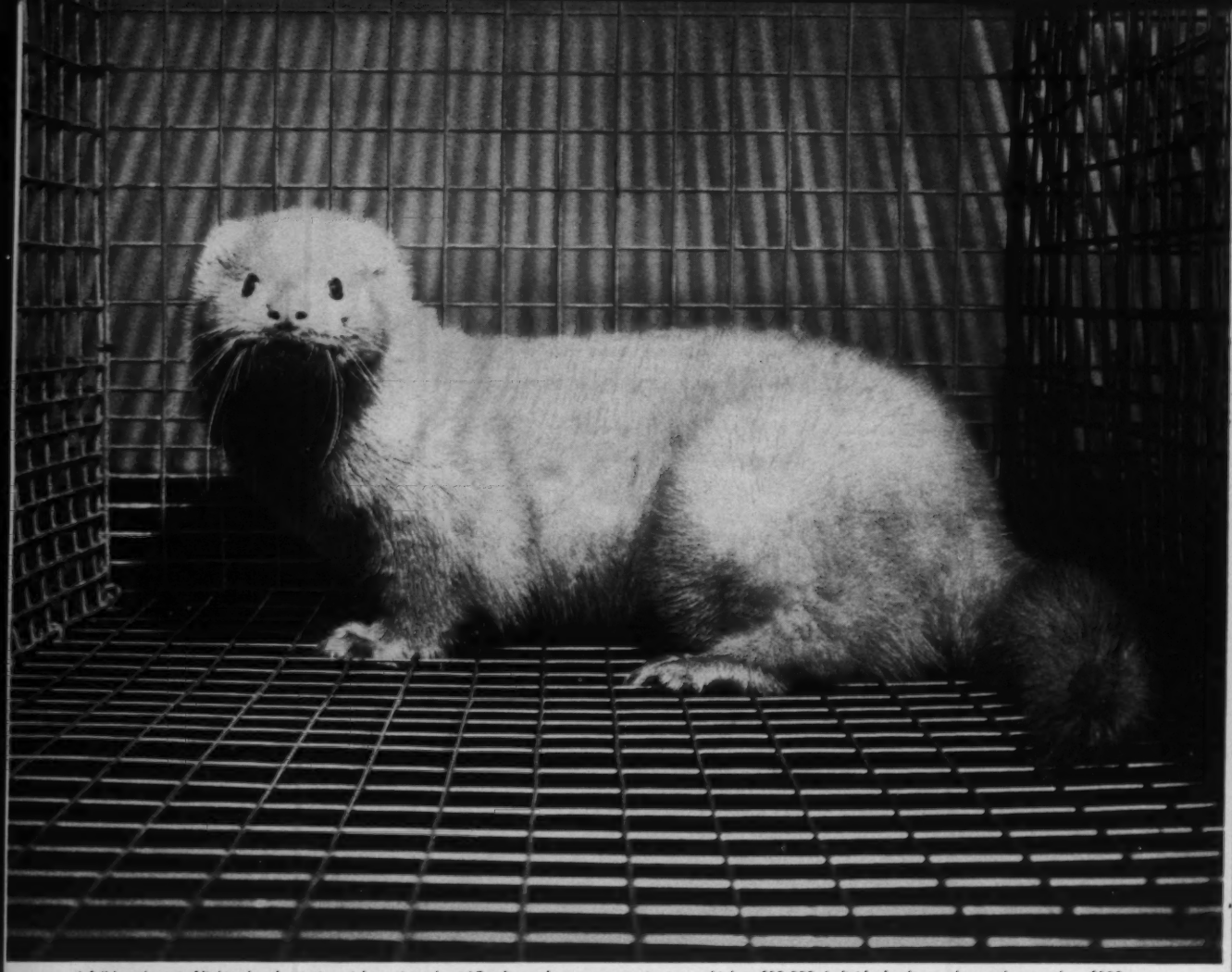
STEEL

MERGERS, BIGNESS:

Kennedy Turns Screws Tighter

The Justice Department and the Federal Trade Commission are increasing their drives against mergers and bigness in industry. See next week's STEEL for a look at the Kennedy administration's attitudes and actions.

Editors will report what metalworkers are targets and how they can guard against government action.



A full-length coat of light-colored mutation mink requires about 65 pelts, and may carry a price tag as high as $10,000. Individual pelts may be worth as much as $100.

Bethanized steel wire protects her $100 coat

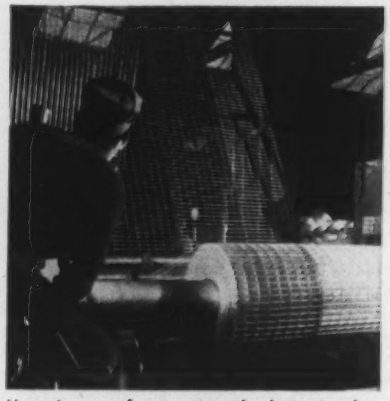
Several years ago, Victor Peternel, a mink rancher in Meadowlands, Pa., was troubled by a costly problem. Rust stains from wire cages downgraded the valuable pelts of his light-color minks, often cutting their sale price in half. Also, he replaced the pens constantly, because ordinary galvanized wire didn't resist the abrasive action of the animals' feet and the harsh corrosion caused by their body acid.

Mr. Peternel, who makes mink cages for his own use and supplies mink wire to other ranchers, consulted with a manufacturer of welded steel wire fabric. They decided to try Bethlehem's bethanized wire, with an extra heavy, C coating of 99.9 per cent pure zinc. After several years the trial cages showed not one spot of rust.

Bethanizing Gives Heavier Coating Weights Than Hot-Dip Galvanizing

Bethanizing, our electrolytic zinc-coating process, makes possible a wide range of coating weights. Including the C coating, four standard weights are available: A; B, twice the A coating; the C coating, three times A; and D, four times the A weight.

Bethanizing also assures complete uniformity, tight bond, high ductility, and ability to withstand severe forming. For more information, get in touch with the nearest Bethlehem office. Or write to us in Bethlehem, Pa.



Here, in one of our customers' plants, is where Bethlehem's bethanized (C coating) wire is made into welded-fabric. It is spooled in 100-ft rolls for such applications as mink cages and chicken pens.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Sales:* Bethlehem Steel Export Corporation

Steel *for Strength ... Economy ... Versatility*

BETHLEHEM STEEL

BETHLEHEM STEEL

Reeves Steel gets top quality product, record output from Wean Galvanizing Line

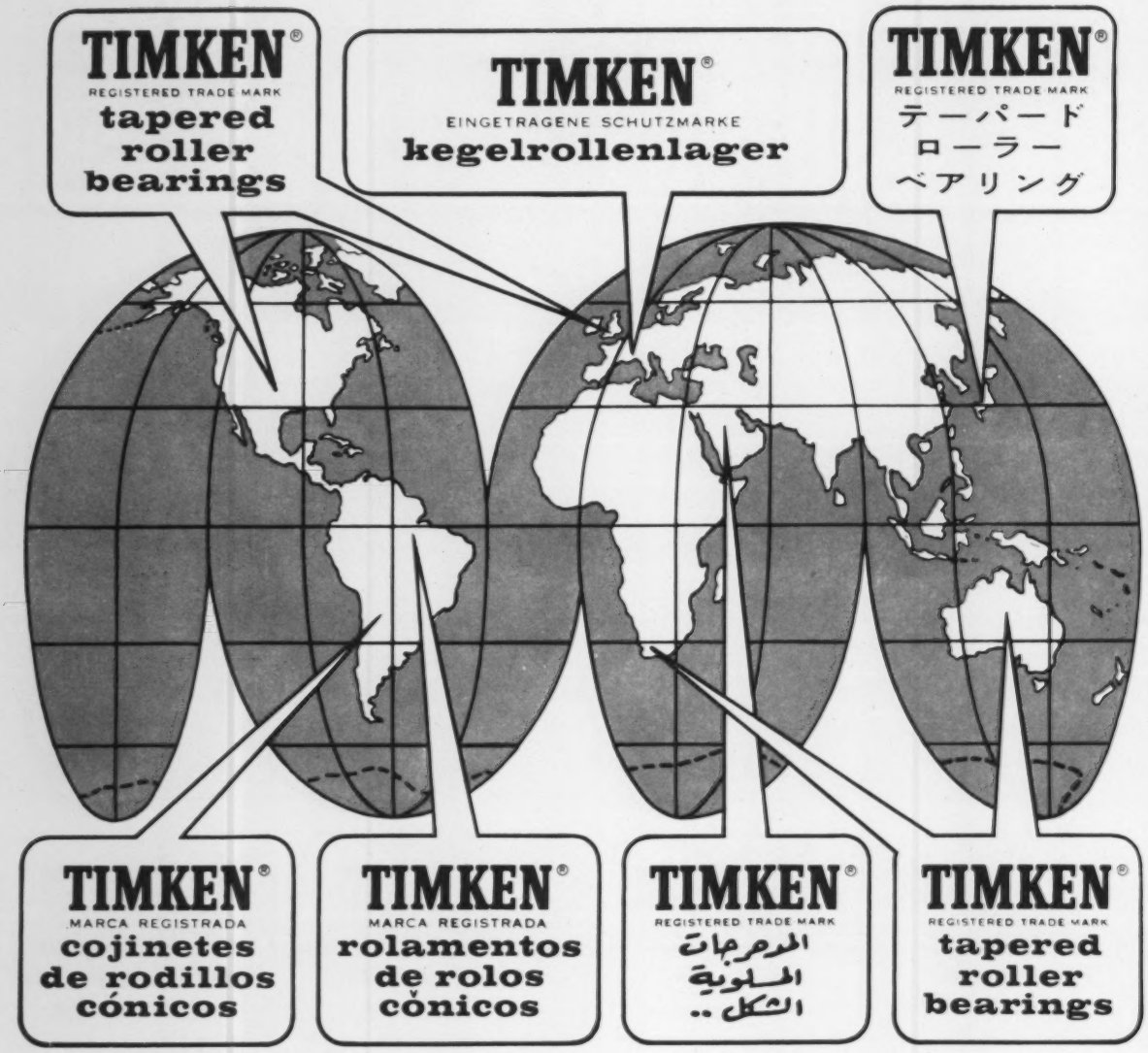
The quality reputation of Reeves TiteKote® galvanized steel—and Reeves finished galvanized products—is well established. Produced by the Reeves Steel and Manufacturing Division of Empire-Reeves Steel Corporation on a 36" Wean line, TiteKote's excellent quality derives from both the outstanding operating practices of Reeves personnel and dependability of the equipment.

Installed at the Reeves Mill in Dover, Ohio in 1955, the Wean line has given trouble-free service since start-up. The Wheeling-type line handles gauges from 16 to 30, top speed on the lighter materials being 310 fpm. Strip from 18" to 36" wide in coils up to 26,000 lbs. is fed to the line after annealing and a temper pass on a two-high mill.

Wean's experience in continuous processing line design and construction has been built over 31 years service to the steel industry. Wean's "creative engineering" can make a major contribution to expansion or modernization of your finishing facilities.

WEAN

THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO



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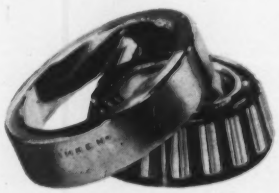
And when you buy Timken bearings, you're assured of the engineering service of the world's most experienced and largest manufacturer of tapered roller bearings. The name "Timken" is a trade-mark identifying the bearings, steel and rock bits made by The Timken Roller Bearing Company and its subsidiaries and divisions the world over. The Timken Roller Bearing Company, Canton 6, Ohio, U.S.A. Cable address: "TIMROSCO". Timken bearings manufactured in U.S.A., Australia, Brazil, Canada, England and France.